AUDIO/VIDEO STEREO RECEIVER

KR-V9020

SERVICE MANUAL

KENWOOD

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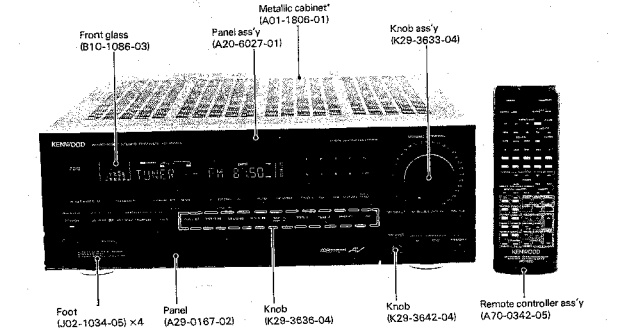
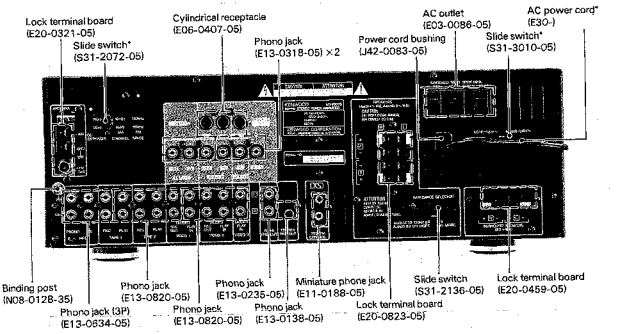
B51-4134-00(B)1750





* Refer to parts list on page 73.

KR-V9020

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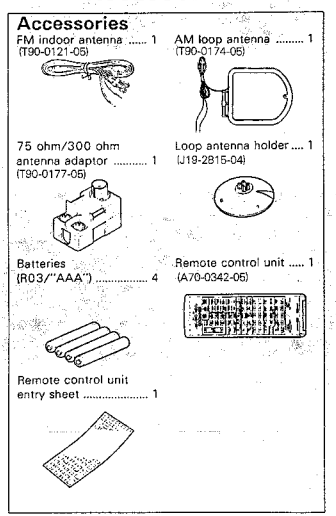
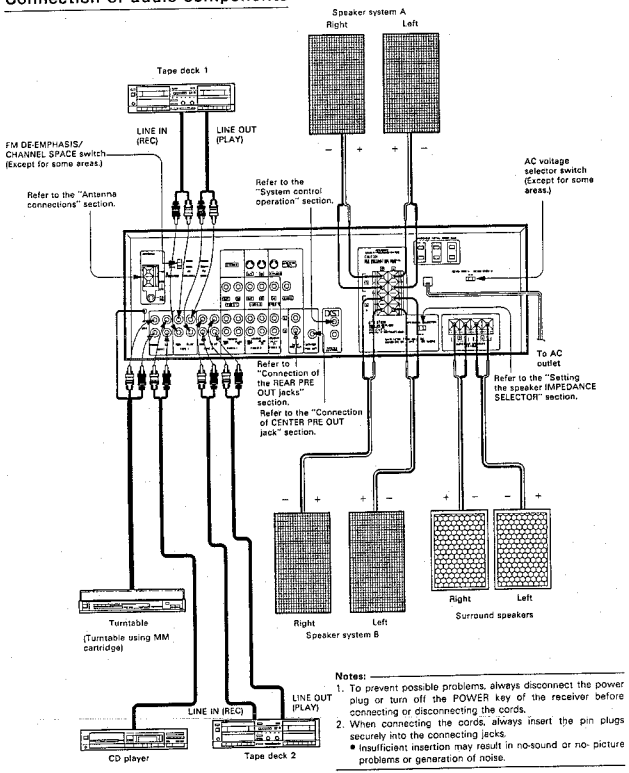


SYSTEM CONNECTIONS

Make connections as shown in the diagram below. When connecting the related system components, refer also to the instruction manuals of the related components.
Do not plug in the power lead until all connections are complete.

Connection of audio components



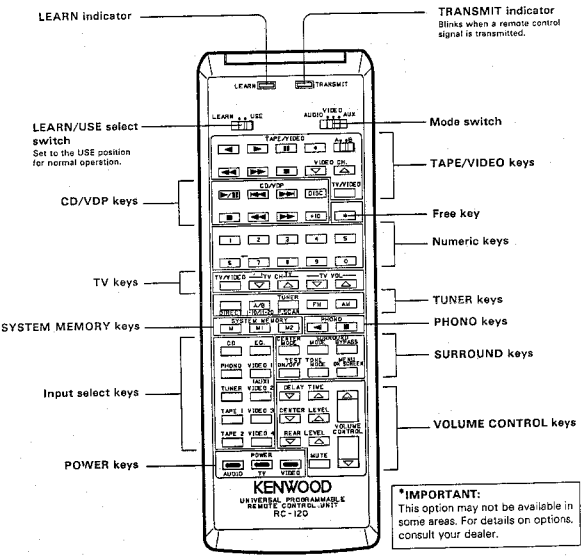
Notes:

1. To prevent possible problems, always disconnect the power plug or turn off the POWER key of the receiver before connecting or disconnecting the cords.
2. When connecting the cords, always insert the pin plugs securely into the connecting jacks.
   - Insufficient insertion may result in no-sound or no- picture problems or generation of noise.

REMOTE CONTROL OPERATION

The remote control unit (RC-120) is capable of the remote control of this unit as well as other KENWOOD system components connected to this unit via system control cords, *KENWOOD VCR and *TV. In addition, it is also possible to program the remote-controllable functions of other A/V components in the memory of RC-120, making it a multi-purpose remote controller for the whole of your system.

Names and operation of controls



*IMPORTANT:
This option may not be available in some areas. For details on options, consult your dealer.

■ Remote control operation

1. The whole of the keys can be used in three ways (three sides) by selecting the mode switch position. The AUDIO and VIDEO sides contains the initial programming of KENWOOD-original remote-control codes. (Please refer to "Original functions of keys".)

Mode switch

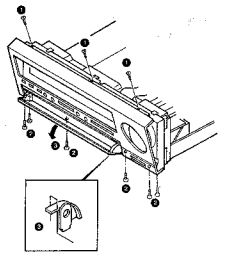
- AUDIO position: For the remote control of KENWOOD system components and KENWOOD TV.
- VIDEO position: For the remote control of KENWOOD VCR, KENWOOD TV and part of KENWOOD system components.
- AUX position: All keys are available, that is, able to store the programming of other remote control functions.

2. The remote control functions of other A/V components can also be programmed under the keys on the AUDIO and VIDEO sides as well as on the AUX side. However, when any information is programmed under a key on the AUDIO or VIDEO side, the original function pre-programmed under that key becomes unavailable.

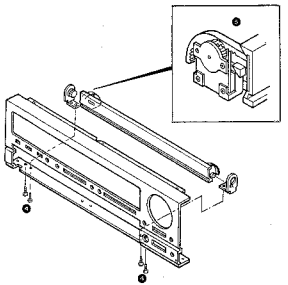
DISASSEMBLY FOR REPAIR

1. Removing the front panel ass'y

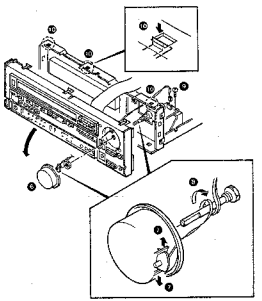
1. Remove the three screws in the upper side (❶).
2. Remove the six screws in the lower side (❷).
3. When removing, do not hit the damper (❸).



4. Remove the four screws (❹).
5. When installing, put gears into alignment as shown (❺).



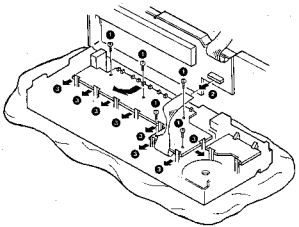
6. Detach the knob and its accompanying nut (❻).
7. Disconnect the LED VOL. board (❼).
8. When installing the knob, rotate the VOL. clockwise and set the cord as shown (❽).
9. When disconnecting the (X14-) (D/6) board, remove the one screw and disconnect the connector (❾).
10. Undo the three catches (❿).



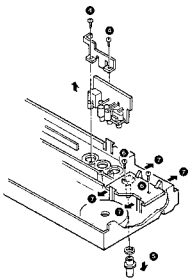
DISASSEMBLY FOR REPAIR

2. Removing the PC boards

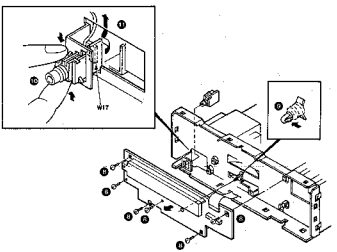
1. Remove the five screws (❶).
2. Disconnect the connector (❷).
3. Undo the eight catches (❸).



4. Remove the two screws (❹).
5. Detach the knob and its accompanying nut (❺).
6. Remove the two screws (❻).
7. Undo the four catches (❼).



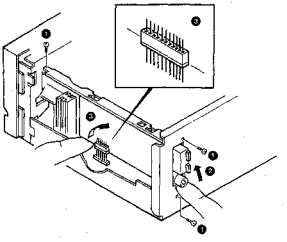
8. Remove the six screws (❽).
9. Detach the unit holder (❾).
10. Push the upper and lower catches (❿), then disconnect cord W17 pulling it lightly in the direction of the arrow (⓫).



DISASSEMBLY FOR REPAIR

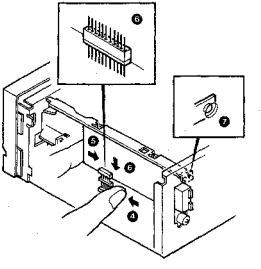
3. Removing the (X05-) (A/2) board

1. Remove the three screws (❶).
2. While pressing the ANT terminal (❷), disconnect the connector (❸).



4. Installing the (X05-) (A/2) board

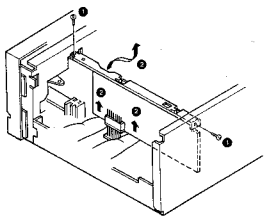
3. Place the board, and push the connector (❹).
4. Push the board (❺).
5. Put connector pins in alignment, then push the board from above (❻).
6. Set it to the recession (❼).



DISASSEMBLY FOR REPAIR

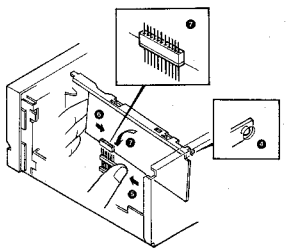
5. Removing the (X08-) (A/7) board

1. Remove the two screws (❶).
2. Disconnect the connector (❷).

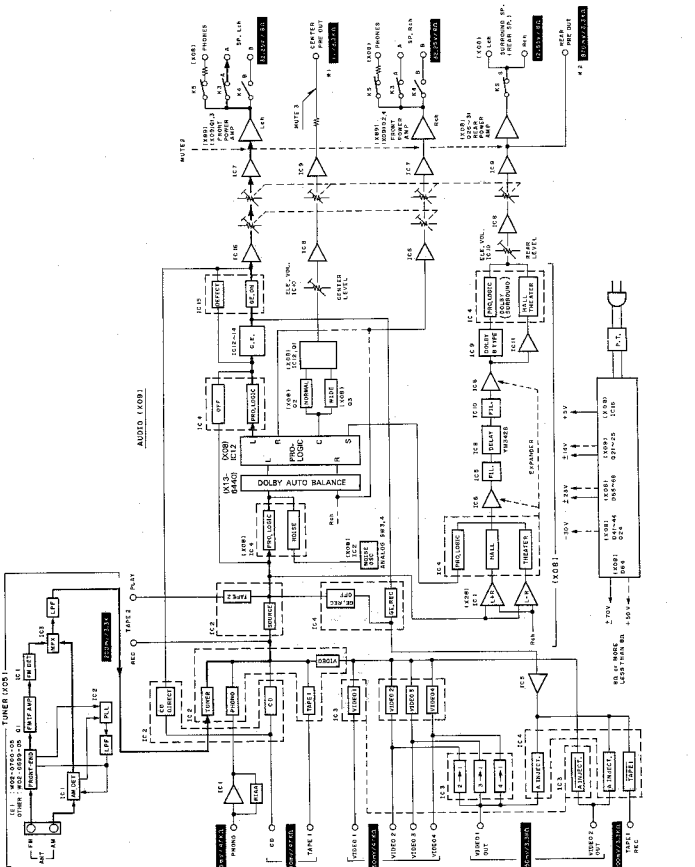


6. Installing the (X08-) (A/7) board

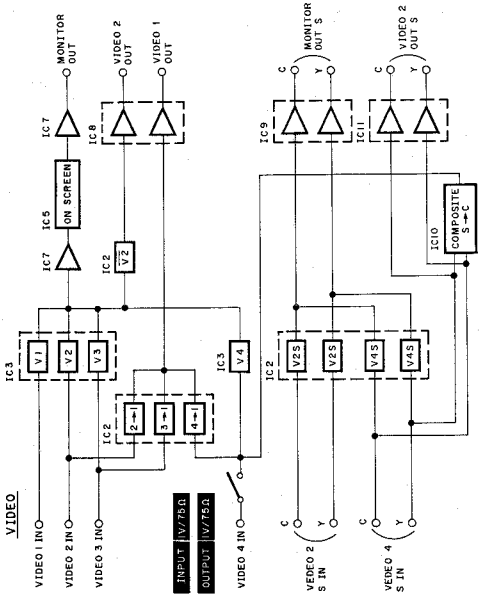
4. Set it to the recession (❹).
5. Push the connector (❺).
6. Push the board (❻).
7. Put connector pins in alignment, then push the board from above (❼).



BLOCK DIAGRAM



BLOCK DIAGRAM



CIRCUIT DESCRIPTION

1. Description of components

1-1. TUNER UNIT (X05-353X-XX) 0-11 : K,P 0-82 : Y

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compativility
Q1	2SC1923(R,O)	FM IF amplifier	
Q2	2SC945(A)(Q,P)	LPF (Low Pss Filter)	Compatible with 2SC1740S(Q,R).
Q3	2SC1846(F,E)	LPF (Low Pss Filter)	
Q4	2SC945(A)(Q,P)	Buffer amplifier	For the E version only. Compatible with 2SC1740S(Q,R).
Q5, 6	2SC945(A)(Q,P)	Emphasis select	75μs when ON, 50μs when OFF. For the U, UE version only. Compatible with 2SC1740S(Q,R).
Q7, 8	2SA733(A)(Q,P)	+B power supply select	Q7 : FM +B (ON in FM mode), Q8 : AM +B (ON in AM mode). Compatible with 2SA933S(Q,R).
IC1	LA1265	FM IF/AM detection	
IC2	LM7001	PLL (Phase Locked Loop)	
IC3	AN7470	MPX (Multiplexer)	

1-2. PRE AMPLIFIER UNIT (X08-230X-XX) 0-10 : K 1-01 : P 0-81 : Y

Ref. No	Parts No.	Use/Function	Operation/Condition/Compatibility
Q1	2SC945(A)(Q,R)	Center OFF select	Turns ON when center OFF. Compatible with 2SC1740S(Q,R).
Q2	2SC2878(B)	Center mode select	Turns ON when normal mode. If Q2 and Q3 turns OFF
Q3	2SC2878(B)	Center mode select	Turns ON when wide mode. when fantom mode.
Q5	2SA733(A)(Q,P)	Test tone switching	Turns ON when test tone ON. Compatible with 2SA933S(Q,R).
Q21	2SD1302(S,T)	Relay drive	For the power relay.
Q22	2SC945(A)(Q,P)	CE control	Compatible with 2SC1740S(Q,R).
Q23	2SA733(A)(Q,P)	Filament ON/OFF	Compatible with 2SA933S(Q,R).
Q24	2SB722(Q,P)	Constant voltage circuit	For the -30V power supply.
Q25	2SA922(F,E)	Impedance detector	4Ω/8Ω detect.
Q26, 27	2SA922(F,E)	Referential amplifier	
Q28	2SC1845(F,E)	Pre drive	
Q29	2SC4137	Bias compensation	
Q30	2SD1693	Final transistor	
Q31	2SB1253	Final transistor	
Q32	2SC1845(F,E)	Current limiter	
Q33	2SA733(A)(Q,P)	Protection	Signal. Compatible with 2SA933S(Q,R).
Q34	2SC945(A)(Q,P)	Relay drive	Surround SP. Compatible with 2SC1740S(Q,R).
Q35	2SC945(A)(Q,P)	Relay drive	Speaker A. Compatible with 2SC1740S(Q,R).
Q36	2SC945(A)(Q,P)	Relay drive	Speaker B. Compatible with 2SC1740S(Q,R).
Q37	2SC945(A)(Q,P)	Relay drive	Phones. Compatible with 2SC1740S(Q,R).
IC1	NJM2058D	Buffer amplifier	
IC2	TC4011UBP	Test tone	Test tone noise oscillator.
IC3	NJM2058D	Test tone	Test tone noise oscillator.
IC4	TC9162N	Analog switch array	
IC5	NJM4565L	LPF	7kHz low pass filter.
IC6	μPC1571C	Analog compounder	
IC7	NJM78L05A	Constant voltage circuit	For the +5V power supply.
IC8	YM3428	Digital delay	
IC9	LA2730	Dolby B type NR IC	
IC10	NJM072BL	LPF	7kHz low pass filter.
IC11	NJM4565L	Buffer amplifier	For the output.
IC12	LA2770	PRO LOGIC IC	
IC16	μPC7805HF	Constant voltage circuit	For the +5V power supply.
IC17	μPC78L12J	Constant voltage circuit	For the +12V power supply.

CIRCUIT DESCRIPTION

1-3. AUDIO UNIT (X09-293X-XX) 0-10 : K,Y 1-01 : P

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q1, 2	2SC2922*5	Main amplifier final stage	
Q3, 4	2SA1216*5	Main amplifier final stage	
Q5, 6	2SC4137	Bias compensation	
Q7, 8	2SC2878(B)	Muting	
Q9, 10	2SC2878(B)	Muting	For the main input.
Q11, 13	2SC2878(B)	Muting	For the rear input.
Q12, 14	2SC2878(B)	Muting	For the center input.
Q21	2SD1266	Constant voltage circuit	For the +15V power supply.
Q22	2SC945(A)(Q,P)	Constant voltage circuit	For the +15V power supply. Compatible with 2SC1740S(Q,R).
Q23, 24	2SD1266	Constant voltage circuit	For the –15V power supply.
Q25	2SA733(A)(Q,P)	Constant voltage circuit	For the –15V power supply. Compatible with 2SA933S(Q,R).
Q26	2SC945(A)(Q,P)	Constant voltage circuit	For the +15V power supply. Compatible with 2SC1740S(Q,R).
Q27	2SA733(A)(Q,P)	Constant voltage circuit	For the –15V power supply. Compatible with 2SA933S(Q,R).
Q28	2SD1266	Constant voltage circuit	For the motor VR +12V power supply.
Q29	2SC2003(L,K)	Ripple filter	For the tuner +5V.
Q30	2SA733(A)(Q,P)	Muting control	High mute. Compatible with 2SA933S(Q,R).
Q32	2SA733(A)(Q,P)	Muting control	Low mute. Compatible with 2SA933S(Q,R).
Q34, 35	2SA945(A)(Q,P)	IC control	For the IC15. Compatible with 2SC1740S(Q,R).
Q36, 37	2SA733(A)(Q,P)	IC control	For the IC15. Compatible with 2SA933S(Q,R).
Q38	2SA733(A)(Q,P)	Muting control	Low mute. Compatible with 2SA933S(Q,R).
IC1	μPC4570C-A	Phono equalizer amplifier	
IC2	TC9164N	Input select	
IC3, 4	TC9163N	Input select	
IC5	NJM4558D	Buffer amplifier	For the REC OUT signal.
IC6, 7	μPC4570C-A	Buffer amplifier	
IC8, 9	NJM4558D	Buffer amplifier	
IC10	TC9176P	Electronic volume	Rear center volume.
IC11	NJM4558D	Buffer amplifier	For the electronic volume.
IC12	LC7522	Electronic volume array	For the GE (Graphic equalizer) volume.
IC13, 14	M5229P	OP amplifier	For the GE.
IC15	LC4966	Selector	GE ON/OFF.
IC16	NJM4558D	Mixing amplifier	For the spectrum analyzer.

1-4. SUB UNIT (X13-6250-10)

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q1	2SD882(Q,P)	Constant voltage circuit	For the +5V power supply.
Q2	2SB772(Q,P)	Constant voltage circuit	For the –5V power supply.
Q3	2SC945(A)(Q,P)	Synchronize separator	Compatible with 2SC1740S(Q,R).
Q4	2SA733(A)(Q,P)	Synchronize separator	Compatible with 2SA933S(Q,R).
Q5	2SC945(A)(Q,P)	Buffer amplifier	Compatible with 2SC1740S(Q,R).
Q6	2SC945(A)(Q,P)	Vertical detector	With buffer amplifier. Compatible with 2SC1740S(Q,R).
Q7	2SC945(A)(Q,P)	Horizontal detector	With buffer amplifier. Compatible with 2SC1740S(Q,R).
Q8	2SD882(Q,P)	Constant voltage circuit	For the +5V power supply.
Q9	2SB772(Q,P)	Constant voltage circuit	For the –5V power supply.
IC1	μPA80C	Level converter	0V → +5V, +5V → –5V. Active low.
IC2–4	μPD4066BC	Video selector	When +5V, switch on.
IC5	MB88323A-K2	On screen IC	
IC6	μPD4069UBC	Inverter	
IC7–11	MC14577A	Video amplifier	

CIRCUIT DESCRIPTION

1-5. AUTO BALANCE UNIT (X13-6440-10)

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
IC1	TDA1074A	VCA	
IC2 1/2	NJM072BD	OP amplifier	Reference voltage
IC2 2/2		OP amplifier	For the IC1
IC3 1/2	NJM072BD	OP amplifier	
IC3 2/2		OP amplifier	V_{LS} Amplifier
Q1	2SC945	Gate Control	For the Q2
Q2	2SK163	Gate Switch	

1-6. DISPLAY UNIT (X14-2700-10)

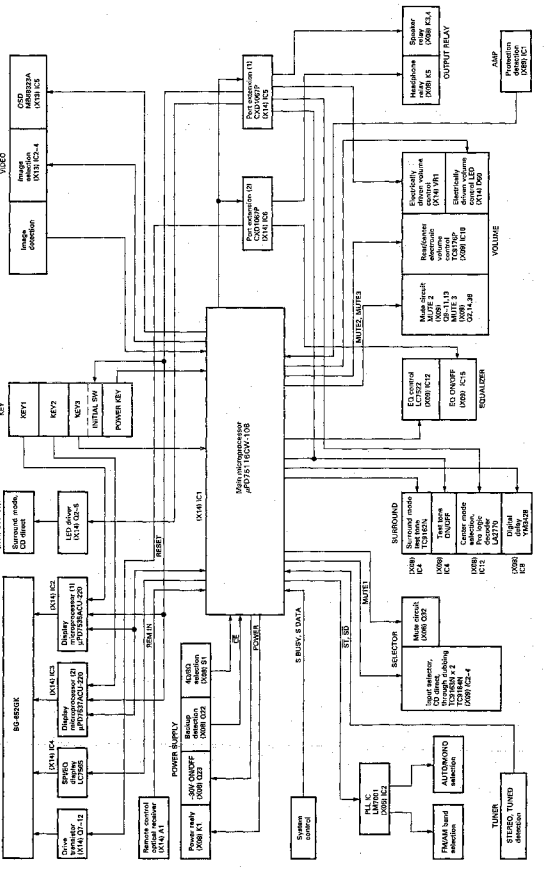
Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q1	2SC945(A)(Q,P)	Reset circuit	Compatible with 2SC1740S(Q,R).
Q2	2SC945(A)(Q,P)	LED driver circuit	Dolby pro logic. Compatible with 2SC1740S(Q,R).
Q3	2SC945(A)(Q,P)	LED driver circuit	Theater. Compatible with 2SC1740S(Q,R).
Q4	2SC945(A)(Q,P)	LED driver circuit	Hall. Compatible with 2SC1740S(Q,R).
Q5	2SC945(A)(Q,P)	LED driver circuit	CD direct. Compatible with 2SC1740S(Q,R).
Q6	2SC945(A)(Q,P)	LED driver circuit	Volume. Compatible with 2SC1740S(Q,R).
Q7	2SA733(A)(Q,P)	FIP dirver	Equalizer "ON". Compatible wuth 2SA933S(Q,R).
Q8	2SA733(A)(Q,P)	FIP driver	Video monitor "4". Compatible with 2SA933S(Q,R).
Q9	2SA733(A)(Q,P)	FIP driver	Video monitor "3". Compatible with 2SA933S(Q,R).
Q10	2SA733(A)(Q,P)	FIP driver	"CENTER". Compatible with 2SA933S(Q,R).
Q11	2SA733(A)(Q,P)	FIP dirver	"REAR". Compatible with 2SA933S(Q,R).
Q12	2SC945(A)(Q,P)	FIP driver	FIP grid current buffer. Compatible with2SC1740S(Q,R).
Q13, 14	DTC124ES	FIP driver	FIP grid current buffer.
IC1	μPD75116CW-108	Microprocessor	Main microprocessor.
IC2, 3	μPD7537ACU-220	Microprocessor	Sub microprocessor, FIP driver and key loading.
IC4	LC7565	FIP driver	GE, spectrum analyzer and rear/center volume level diaplsy driver.
IC5, 6	CXD1067P	I/O port	FIP/LED/Relay driver. For the volume motor and pro logic IC control.
IC7	LB1641	Motor driver	
IC8, 9	NJM2058D	OP amplifier	Spectrum analyzer filter. Compatible with μPC4574C.

1-7. MAIN AMPLIFIER UNIT (X89-110X-XX) 0-10 : K,Y 1-01 : P

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q1~4	2SC1845(F,E)	1st stage voltage amp	
Q5~8	2SC945(A)(Q,P)	1st stage cascode amp	Compatible with 2SC1740S(Q,R).
Q9~12	2SC1845(F,E)	2nd stage voltage amp	
Q13~16	2SA1123(R,S)	3rd stage voltage amp	
Q17, 18	2SA1123(R,S)	3rd stage cascode amp	
Q19, 20	2SC2631(R,S)	3rd stage current mirror	
Q21, 22	2SC3944(Q,R)	Power amplifier driver	
Q23, 24	2SA1535(Q,R)	Power amplifier driver	
Q25, 26	2SC2631(R,S)	Protector, current detector	Positive (+) side.
Q27, 28	2SA992(F,E)	Protector, current detector	Negative (–) side.
Q29	2SA992(F,E)	Protector	Transmits the current detected signal to IC1.
IC1	μPC1237HA	Protector	Relay drive.

CIRCUIT DESCRIPTION

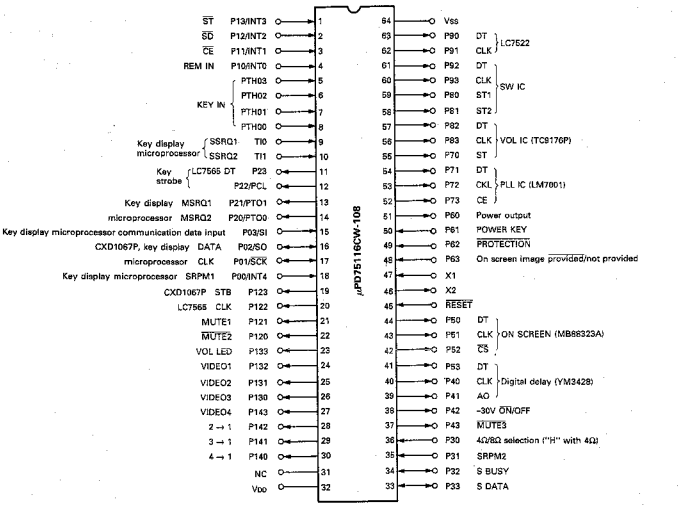
2. Microprocessor peripheral block diagram



CIRCUIT DESCRIPTION

3. Main microprocessor : μPD75116CW-108 (X14- : IC1)

3-1. Terminal connection diagram



3-2. Key matrix

O / I	P22 (57)	P23 (56)	INISW1	INISW2
PTH03 (5)		CD DIRECT	SPI 0 : Not provided 1 : Provided	Upper limit of reception of AM 10kHz. 0 : 1610kHz 1 : 1700kHz
PTH02 (6)	REAR LEVEL DOWN	M-1	SURROUND TYPE 0 : DOLBY 1 : PRO LOGIC	JBAND 0 : Not provided 1 : Provided
PTH01 (7)	REAR LEVEL UP	M-2	Remote control selection 0 : Unified 1 : Learning	VIDEO INPUT 0 : System 3 1 : System 4
PTH00 (8)	MUTE	SYSTEM MEMORY	-	IBAND 0 : K 1 : E

Tact switch — Initial setting diode matrix

CIRCUIT DESCRIPTION

3-3. Explanation of terminals

Pin No.	Pin name	I/O	Symbol	Description
1	P13/INT3	I	$\overline{ST}$	Stereo signal input pin. With the TUNER position, with the selector set at "TUNER", when this pin is "L", "STEREO" is displayed.
2	P12/INT2	I	$\overline{SD}$	Broadcast station existence,nonexistence detection signal input pin, which is used for auto tuning or programmed scan. At "L", "TUNED" is displayed. "H" : With station, "L" : Without station.
3	P11/INT1	I	$\overline{CE}$	Backup detection pin. At "L", the backup mode is engaged to stop the clock.
4	P10/INT0	I	REM IN	Pin to input the signal resultant from detecting the remote control signal. Normally or when reading leader codes, the level is detected. When reading data codes, an interrupt is applied at its fall for detection.
5–8	PTH03–PTH00	I	KEY IN	Microprocessor key matrix signal input pins. Normally "L" (Threshold voltage > VDD x 7.5/16) (Exchange time = 32.3μs)
9	TI0	I	SSRQ1	Pin to input the communication request signal from display microprocessor (1). Normally "L", and "H" with communication request (when a pertinent key of display microprocessor (1) is pressed.)
10	TI1	I	SSRQ2	Pin to input the communication request signal from display microprocessor (2). Normally "L", and "H" with communication request (when a pertinent key of display microprocessor (2) is pressed.)
11	P23	O (CMOS)	LC7565 DT Key strobe	Pin to output the DT signal to graphic equalizer IC LC7565. Main microprocessor key matrix strobe signal pin. Normally "L", and "H" when key is taken in.
12	P22/PCL	O (CMOS)	Key strobe	Main microprocessor key matrix strobe signal pin. Normally "L", and "H" when key is taken in.
13	P21/PTO1	O (CMOS)	MSRQ1	Pin to output the communication request signal from the main microprocessor to display microprocessor (1). Normally "L", and "H" with communication request (per 8 bits.) During power ON, pulse is output to transfer display data at all times. (Refer to the communication format for between master and slave.)
14	P20/PTO0	O (CMOS)	MSRQ2	Pin to output the communication request signal from the main microprocessor ro display microprocessor (2). Same as MSRQ1 for the rest.
15	P03/SI	I		Display microprocessor (1), (2) communication data input pin, to which the status data of the key matrix of each display microprocessor is input.
16	P02/SO	I/O		Data output pin of port extension IC CXD1067P and display microprocessors (1) and (2).
17	P01/$\overline{SCK}$	I/O		Clock output pin of port extension IC CXD1067P and display microprocessors (1) and (2). Normally "H". During power ON, pulse is output to transfer display data at all times.
18	P00/INT4	I	SRPM1	Pin to input the communication acknowledge signal from display microprocessor (1).
19	P123	O (N-ch open drain)	CXD1067P STB	Port extension IC CXD1067P latch signal output pin. Normally "L", and latch at "H".
20	P122	O (N-ch open drain)	LC7565 CLK	Pin to output the clock signal to graphic equalizer display IC LC7565. Normally "L".
21	P121	O (N-ch open drain)	MUTE1	Pin to output a muting signal in input selection or during tuner scanning, etc. Normally "L", and active "H".
22	P120	O (N-ch open drain)	$\overline{MUTE2}$	Pin to output a muting signal for audio muting or for such a selection as TAPE2 ON/OFF, EQ ON/OFF, EQ REC ON/OFF, etc. Normally "L", and active "H".
23	P133	O (N-ch open drain)	VOL LED	Electrically driven volume control point indicator. Normally "H" (LED lights ON.) LED lights ON 4sec at power ON and flickers in ON/OFF interval of 500msec during muting. LED flickers in ON/OFF intervals of 64msec while volume is turned up or down by an electrically driven volume control from the remote control.

CIRCUIT DESCRIPTION

Pin No.	Pin name	I/O	Symbol	Description
24–26	P132–P130	O (N-ch open drain)	VIDEO1~VIDEO3	Pins to control the video monitor and the video REC output of VIDEO1/ VIDEO2. Through dubbing is also involved.
27	P143		VIDEO4	
28	P142		2 → 1	
29	P141		3 → 1	
30	P140		4 → 1	

Status			Port status						
Model	Video monitor	Through dubbing status	VIDEO1	VIDEO2	VIDEO3	VIDEO4	2 → 1	3 → 1	4 → 1
KR-V9020	VIDEO1	OFF	0	1	1	1	1	1	1
		2 → 1	0	1	1	1	0	1	1
		3 → 1	0	1	1	1	1	0	1
		4 → 1	0	1	1	1	1	1	0
	VIDEO2	OFF	1	0	1	1	0	1	1
		2 → 1	1	0	1	1	0	1	1
		3 → 1	1	0	1	1	1	0	1
		4 → 1	1	0	1	1	1	1	0
	VIDEO3	OFF	1	1	0	1	1	0	1
		2 → 1	1	1	0	1	0	1	1
		3 → 1	1	1	0	1	1	0	1
		4 → 1	1	1	0	1	1	1	0
	VIDEO4	OFF	1	1	1	0	1	1	0
		2 → 1	1	1	1	0	0	1	1
		3 → 1	1	1	1	0	1	0	1
		4 → 1	1	1	1	0	1	1	0
KR-V8020	VIDEO1	OFF	1	0	0	0	0	0	1
		2 → 1	1	0	0	0	1	0	0
		3 → 1	1	0	0	0	0	1	0
	VIDEO2	OFF	0	1	0	0	0	0	1
		2 → 1	0	1	0	0	1	0	0
		3 → 1	0	1	0	0	0	1	0
	VIDEO3	OFF	0	0	1	0	0	0	1
		2 → 1	0	0	1	0	1	0	0
		3 → 1	0	0	1	0	0	1	0

31	NC			
32	VDD			Microprocessor power supply pin.
33	P33	I/O (CMOS)	SDATA	System serial communication DATA signal I/O pin. Normally, input mode is engaged. Only when serial data is output, output mode is engaged.
34	P32	I/O (CMOS)	SBUSY	System serial communication BUSY signal I/O pin. Normally, input mode is engaged. Only when serial data is output, output mode is engaged.
35	P31	I	SRPM2	Pin to input the communication acknowledge signal from display microprocessor (2).
36	P30	I	4Ω/8Ω selection	Transformer tap selection switch input pin. "H" : 4Ω, "L" : 8Ω
37	P43	O (CMOS)	MUTE3	CENTER REC OUT muting pin. Only for Normal or Wide mode of PRO LOGIC. Normally "L". Pulse is output in such a selection as TAPE2 ON/OFF, EQ ON/ OFF, etc.
38	P42	O (CMOS)	–30V ON/OFF	Pin to output the control signal to turn ON/OFF –30V of FL power to light the EQ/SPI display and other sections of the FL display concurrently. AN "H" signal is output about 500ms later after the power supply pin becomes "H".
39	P41	O (CMOS)	YM3428 AO	Digital delay IC YM3428 control signal output pins.
40	P40		YM3428 CLK	
41	P63		YM3428 DT	

CIRCUIT DESCRIPTION

Pin No.	Pin name	I/O	Symbol	Description
42	P82	O (CMOS)	MB88323A CS	OSD IC MB88323A control signal output pins.
43	P81		MB88323A CLK	
44	P80		MB88323A DT	
45	RESET			Microprocessor reset input pin. Normally "H".
46	X2	O		System clock oscillation pins (4.194MHz).
47	X1	I		
48	P83	I		OSD video signal existence/nonexistence detection input pin. "H" : Nonexistence, "L" : Existence. At "H" (nonexistence), the screen goes blue.
49	P92	I	PROTECTION	Pin to input the protection signal detection when speaker is shorted. During power ON, when this pin becomes "L", the speaker relay is turned off and "PROTECTION" is displayed. At this time, any other key than the power key is invalid.
50	P61	I	POWER KEY	Power key input pin. "H" with key ON.
51	P60	O (CMOS)	POWER	Power relay control output pin. "H" : Power ON, "L" : Power OFF.
52	P73	O (CMOS)	LM7001 CE	PLL IC LM7001 control signal output pins.
53	P72		LM7001 CLK	
54	P71		LM7001 DT	
55	P70	O (CMOS)	TC9176P ST	Electronic volume control IC TC9176P control signal output pins.
56	P83		TC9176P CLK	
57	P82		TC9176P DT	
58	P81	O (CMOS)	ST2	Function switch IC control signal output pins.
59	P80		ST1	One TC9162N, one TC9164N and two TC9163N's are controlled by these four pins.
60	P93		CLK	
61	P92		DT	CLK and DT are common to each IC. ST1 is used for TC9162N, TC9163N's and TC9164N. ST2 is used for TC9163N (IC4).
62	P91	O (CMOS)	LC7522 CLK	EQ IC LC7522 control signal output pins.
63	P90		LC7522 DT	
64	Vss			GND pin.

3-4. Port extension IC : CXD1067P (X14- : IC5, 6)

• Pin assignment of IC5

Output pins	P1 (1)	P2 (2)	P3 (3)	P4 (4)	P5 (5)	P6 (6)
Description	Speaker A relay	Speaker B relay	Electrically driven volume control volume up	Electrically driven volume control volume down	INI SW1 display micro-processor reset	INI SW2
Output pins	P7 (7)	P8 (8)	P9 (9)	P10 (11)	P11 (12)	P12 (13)
Description	Rear speaker relay	TEST TONE ON/OFF	CENTER ON/OFF	NORMAL MODE	WIDE MODE	–

• Pin assignment of IC6

Output pins	P1 (1)	P2 (2)	P3 (3)	P4 (4)	P5 (5)	P6 (6)
Description	FL "V4" display	FL "V3" display	FL "ON" display	FL "CENTER" display	FL "REAR" display	Headphone realy
Output pins	P7 (7)	P8 (8)	P9 (9)	P10 (11)	P11 (12)	P12 (13)
Description	EQ OFF	EQ ON	DOLBY PRO LOGIC LED	THEATER LED	HALL LED	CD DIRECT LED

CIRCUIT DESCRIPTION

• Explanation of terminals (IC5)

Pin No.	Pin name	I/O	Symbol	Description
1	P1	O	SPA	Speaker relay A control pin. ON : "H", OFF : "L"
2	P2	O	SPB	Speaker relay B control pin. ON : "H", OFF : "L"
3	P3	O	VOL UP	Electrically driven volume control volume up signal. Active "H"
4	P4	O	VOL DOWN	Electrically driven volume control volume down signal. Actve "H"
5	P5	O	INISW1	Initial setting switch take-in strobe signal. Display microprocessor reset signal (Temporarily "H" at power ON).
6	P6	O	INISW2	initial setting switch take-in strobe signal.
7	P7	O	REAR SP	Rear speaker relay control signal. ON : "H", OFF : "L"
8	P8	O	TEST TONE ON/OFF	PRO LOGIC test tone ON/OFF control signal. ON : "L", OFF : "H"
9	P9	O	CENTER ON/OFF	Three pins P9~P11 make outputs as follows, according to the internal CENTER mode status of the microprocessor with power ON independent of a SURROUND mode or the status of the SURROUND bypass.
11	P10	O	NORMAL	
12	P11	O	WIDE	
13	P12	O		Unused.

Pin / CENTER mode	NORMAL	WIDE	CENTER OFF
NORMAL	1	0	0
WIDE	0	1	0
PHANTOM	0	0	0
CENTER OFF	0	0	1

• Explanation of terminals (IC6)

Pin No.	Pin name	I/O	Symbol	Description
1	P1	O	V4	FL static display control pin. "H" : Goes out, "L" : Lights on.
2	P2	O	V3	
3	P3	O	ON	
4	P4	O	CENTER	
5	P5	O	REAR	
6	P6	O	HEADPHONE	Headphone relay control pin. ON : "H", OFF : "L"
7	P7	O	EQ OFF	EQ ON/OFF control pin.
8	P8	O	EQ ON	
9	P9	O	DOLBY PRO LOGIC	LED display pins. "H" : Lights on, "L" : Goes out
11	P10	O	THEATER	
12	P11	O	HALL	
13	P12	O	CD DIRECT	

Pin / Status	EQ OFF	EQ ON
EQ OFF	1	0
EQ ON	0	1
CD DIRECT ON	0	0

CIRCUIT DESCRIPTION

3-5. Switch IC : TC9164N, TC9163N (X09- : IC2 ~ 3), TC9162N (X08- : IC4)

• Assignment

SW pins / IC	S1	S2	S3	S4	S5	S6	S7	S8
TC9164N (ST1) (X09-) IC2	VIDEO	TUNER	TAPE1	PHONO	$\overline{\text{TAPE2}}$	TAPE2	CD	CD DIRECT
TC9163N (ST1) (X09-) IC3	4 → 1	3 → 1	2 → 1	VIDEO4	VIDEO3	VIDEO2	VIDEO1	$\overline{\text{V2 AI}}$
TC9163N (ST2) (X09-) IC4	HALL	PRO LOGIC	$\overline{\text{PRO LOGIC}}$	$\overline{\text{TAPE1}}$	V2 AI	V1 AI	EQ REC	$\overline{\text{EQ REC}}$

• TC9162N control

Status		L							R						
		S1	S2	S3	S4	S5	S6	S7	S1	S2	S3	S4	S5	S6	S7
TEST TONE ON	L ch (L)	O	–	–	O	–	–	–	–	O	O	–	O	–	–
	C ch (L+R)	O	–	–	O	–	–	–	–	O	–	O	–	O	O
	R ch (R)	O	–	–	O	–	–	–	–	O	O	–	–	–	O
	S ch (L–R)	O	–	–	O	–	–	O	–	O	–	O	O	–	O
KR-V9010 SURROUND	PRO ROGIC	–	O	–	O	–	–	O	O	–	–	–	–	–	–
	THEATER	–	–	O	–	–	O	–	–	–	–	–	–	–	–
	HALL	–	–	O	–	O	–	–	–	–	–	–	–	–	–
KR-V8010 SURROUND	DOLBY	–	–	–	O	–	O	–	–	–	–	–	–	–	–
	THEATER	–	–	O	–	–	O	–	–	–	–	–	–	–	–
	HALL	–	–	O	–	O	–	–	–	–	–	–	–	–	–
SURROUND BYPASS		–	–	–	–	–	–	–	–	–	–	–	–	–	–

O : SW ON, – : SW OPEN

3-6. PLL IC : LM7001 (X05- : IC2) port assignment

	BO1 (2)	BO3 (9)
FM	1	0
AM	0	1
Other than tuner	0	0

	BO2 (8)
AUTO	0
MONO	1

0 : Short 1 : Open

3-7. GE VR : LC7522 (X09- : IC12) control

S pin (13) = VEE
f1 = 60Hz ... f7 = 15kHz

3-8. EQ/SPI display IC : LC7565 (X14- : IC4) control

S1 pin (15) = VSS
S2 pin (16) = VSS
f1 = 60Hz ... f7 = 15kHz

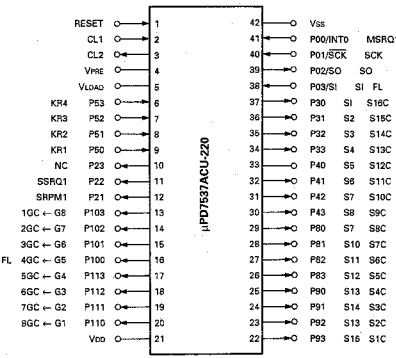
3-9. Electronic volume control : TC9176P (X09- : IC10) control

R side : Rear volume
L side : Center volume

CIRCUIT DESCRIPTION

4. Sub microprocessor (1) : µPD7537ACU-220 (X14- : IC2)

4-1. Terminal connection diagram



4-2. Key matrix (KEY1)

O / I	G1 P110 (20)	G2 P111 (19)	G3 P112 (18)	G4 P113 (17)	G5 P100 (16)	G6 P101 (15)	G7 P102 (14)	G8 P103 (13)
KR1 P50 (9)	EQ B	EQ C	EQ D	EQ f UP	EQ A	EQ DOWN	–	EQ f DOWN
KR2 P51 (8)	–	–	VIDEO4 (VIDEO3)	DOLBY PRO LOGIC (DOLBY)	HALL	SURROUND BYPASS	THEATER	SP A
KR3 P52 (7)	EQ MEMORY	SPI/EQ	EQ REC ON/OFF	EQ ON/DEFEAT	EQ UP	SP B	CHARACTER	DIRECT
KR4 P53 (6)	6	1	–	TUNING DOWN	AUTO/MANU.	TUNING UP	DIGIT	TUNER MEMORY

( ) for KR-V8020

CIRCUIT DESCRIPTION

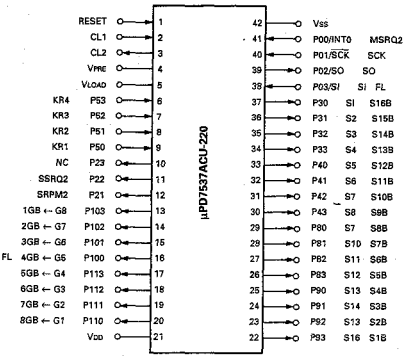
5-3. Explanation of terminals

Pin No.	Pin name	I/O	Symbol	Description
1	RESET	I		Display microprocessor reset pin. Reset is applied by the INI:SW1 of extension IC CXD1057P which is controlled by the main microprocessor.
2	CL1	I		Display microprocessor system clock oscillation pins (600kHz).
3	CL2	O		
4	VPRE			Display pin predriver power supply pin.
5	VLOAD			Display pin load power supply pin (–30V).
6–9	P53–P50	I	KR4–KR1	Key matrix return signal input pins.
10	P23	O	NC	Unused pin, which should be open.
11	P22	O	SSRQ2	Pin to output the communication request signal from the display microprocessor to the main microprocessor. Normally "L", and "H" with communication request (when a pertinent key of display microprocessor is pressed).
12	P21	O	SRPM2	Pin to input the communication acknowledge signal from the display microprocessor to the main microprocessor (per 8-bits).
13–16	P103–P100	O	G8–G5	FL grid control signal output pins (1GB–8GB of FL tube).
17–20	P113–P110	(P-ch open drain, mask option, built-in resistor)	G4–G1	
21	VDD			Power supply pin (+5V).
22–25	P93–P90	O	S16–S13	FL segment control signal output pins (S1B–S16B of FL tube).
26–29	P83–P80	(P-ch	S12–S9	
30–33	P43–P40	open drain,	S8–S5	
34–37	P33–P30	mask option, built-in resistor)	S4–S1	
38	P03/SI	I	SI	Pin to input the signal of communication with main microprocessor (display data input).
39	P02/SO	O	SO	Pin to output the signal of communication with main microprocessor (key data output).
40	P01/SCK	I	SCK	Pin to input the clock for communication with main microprocessor.
41	P00/INT0	I	MSRQ2	Pin to input the communication request signal from main microprocessor (per 8-bits).
42	VSS			GND pin.

CIRCUIT DESCRIPTION

5. Sub microprocessor (2) : µPD7537ACU-220 (X14- : IC3)

5-1. Terminal connection diagram



5-2. Key matrix (KEY2)

O / I	G1 P110 (20)	G2 P111 (19)	G3 P112 (18)	G4 P113 (17)	G5 P100 (16)	G6 P101 (15)	G7 P102 (14)	G8 P103 (13)
KR1 P50 (9)	CD (CD DIRECT)	2 → 1	PHONO (CD)	TUNER (PHONO)	TPE1 (TUNER)	0/10	1-10/11-20	5
KR2 P51 (8)	DELAY TIME DOWN	3 → 1	VIDEO1 (TAPE2)	THROUGH DUBBING OFF	TAPE2 (TAPE1)	9	P.SCAN	4
KR3 P52 (7)	CENTER DOWN	4 → 1	VIDEO3 (VIDEO2)	AUDIO INJECTION	VIDEO2 (VIDEO1)	8	AM	3
KR4 P53 (6)	CENTER MODE	CENTER UP	PGM/SET	DELAY TIME UP	EQ E	7	FM	2

( ) for KR-V8020

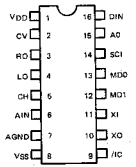
CIRCUIT DESCRIPTION

4-3. Explanation of terminals

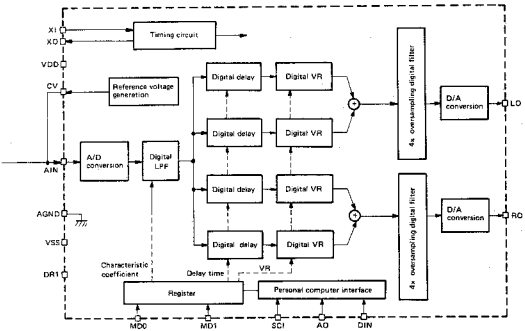
Pin No.	Pin name	I/O	Symbol	Description
1	RESET	I		Display microprocessor reset pin. Reset is applied by the INISW1 of extension IC CXD1057P which is controlled by the main microprocessor.
2	CL1	I		Display microprocessor system clock oscillation pins (600kHz).
3	CL2	O		
4	VPRE			Display pin predriver power supply pin.
5	VLOAD			Display pin load power supply pin (–30V).
6~9	P53~P50	I	KR4~KR1	Key matrix return signal input pins.
10	P23	O	NC	Unused pin, which should be open.
11	P22	O	SSRQ1	Pin to output the communication request signal from the display microprocessor to the main microprocessor. Normally "L", and "H" with communication request (when a pertinent key of display microprocessor is pressed).
12	P21	O	SRPM1	Pin to input the communication acknowledge signal from the display microprocessor to the main microprocessor (per 8-bits).
13~16	P103~P100	O	G8~G5	FL grid control signal output pins (1GC~8GC of FL tube).
17~20	P113~P110	(P-ch open drain, mask option, built-in resistor)	G4~G1	
21	VDD			Power supply pin (+5V).
22~25	P93~P90	O	S16~S13	FL segment control signal output pins (S1C~S16C of FL tube).
26~29	P83~P80	(P-ch	S12~S9	
30~33	P43~P40	open drain,	S8~S5	
34~37	P33~P30	mask option, built-in resistor)	S4~S1	
38	P03/SI	I	SI	Pin to input the signal of communication with main microprocessor (display data input).
39	P02/SO	O	SO	Pin to output the signal of communication with main microprocessor (key data output).
40	P01/SCK	I	SCK	Pin to input the clock for communication with main microprocessor.
41	P00/INT0	I	MSRQ1	Pin to input the communication request signal from main microprocessor (per 8-bits).
42	VSS			GND pin.

CIRCUIT DESCRIPTION

8-3. Terminal connection diagram



8-4. Block diagram



8-5. Explanation of terminals

Pin No.	Pin name	I/O	Description
1	VDD	–	+5V current.
2	CV	O	A/D conversion reference voltage (+2.5V) output pin.
3	RO	O	R-ch output pin (D/A conversion analog output).
4	LO	O	L-ch output pin (D/A conversion analog output).
5	CH	O	Sample-hold capacitor external connection pin.
6	AIN	I	Analog signal input pin (input with the reference of the CV voltage).
7	AGND	–	Grounding pin of A/D and D/A converter sections (Needs to be connected with Vss outside).
8	Vss	–	System grounding pin of digital system and the LSI.
9	/IC	*I	Reset pin.
10	XO	O	X'tal oscillator connection pins.
11	XI	I	(XI is the clock input pin when personal computer is used.)
12	MD1	*I	Mode setting pins.
13	MD0	*I	
14	SCI	I	Data shift clock input pin when personal computer is used.
15	AO	I	Address/data identification signal input pin when personal computer is used.
16	DIN	I	Data input pin when personal computer is used.

Any pin marked with * has a pull-up resistor connected.

CIRCUIT DESCRIPTION

9. Dolby B type noise reduction
: LA2730 (X08- : IC9)

9-1. Outline

This noise reduction circuit is completely different from Dolby B for cassette decks in respect to frequency characteristic.

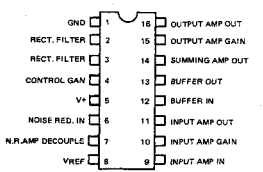
With 500mV = 0dB at Dolby level point 6, a gain control is made by IC6 in IN so as to obtain the same level as in OUT so that IN is of 500mV = 0dB.

Table shows input vs. output characteristics.

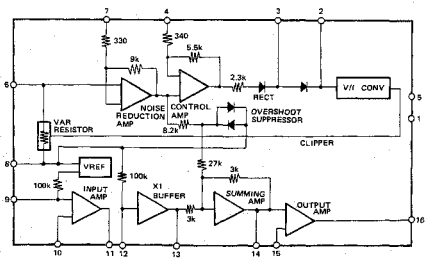
9-2. Modified B type processor decode characteristics

Hz / dB	100	200	500	700	1.0K	1.4k	2.0k	3.0k	5.0k	7.0k	10.0k
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
–5	0.0	0.0	–0.1	–0.1	–0.1	–0.1	–0.1	–0.1	–0.1	–0.1	–0.1
–10	0.0	0.0	–0.3	–0.4	–0.4	–0.4	–0.3	–0.3	–0.3	–0.3	–0.3
–15	0.0	0.0	–0.8	–1.1	–1.4	–1.3	–1.2	–0.9	–0.7	–0.7	–0.7
–20	0.0	0.0	–0.8	–1.6	–2.4	–3.0	–3.0	–2.4	–1.7	–1.5	–1.4
–25	0.0	0.0	–0.9	–1.7	–2.8	–3.8	–4.6	–4.9	–4.1	–3.4	–2.9
–30	0.0	0.0	–1.0	–1.7	–2.9	–4.0	–5.0	–5.4	–5.4	–5.6	–5.2
–35	0.0	0.0	–1.0	–1.7	–2.9	–4.0	–5.0	–5.5	–5.6	–5.8	–5.7
–40	0.0	0.0	–1.0	–1.7	–2.9	–4.0	–5.0	–5.5	–5.7	–5.8	–5.8

9-3. Terminal connection diagram



9-4. Block diagram



CIRCUIT DESCRIPTION

10. Display controller CMOS LSI : MB88323A-K2 (X13- : IC5)

10-1. Outline

The MB88323A-K2 is a display controller CMOS LSI to display characters and graphic patterns on the TV display under the control from the microprocessor. The display size is 20 characters x 9 lines.

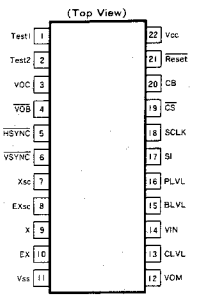
This LSI with a built-in character generator ROM creating 64 kinds of characters is capable of displaying alphanumeric characters and special characters.

Moreover, this LSI has a built-in character generator RAM creating programmable 62 kinds of characters, too. With character patterns set in this RAM, it is also capable of a wide variety of usages such as semi-graphic displays, etc. by combining character patterns in sequence, including alphanumeric characters and special characters.

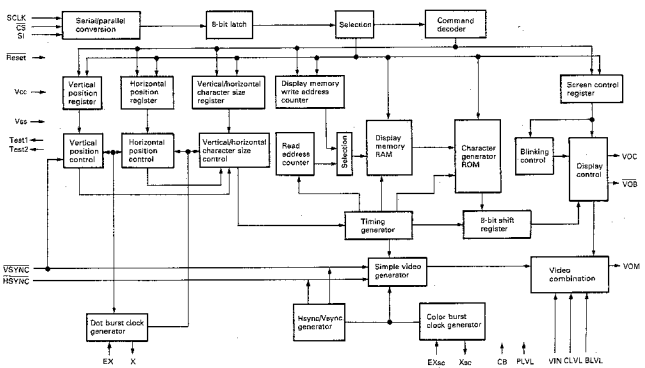
This LSI is also provided with a dot interpolation feature for fineness of oblique lines and can expand the character size for example to 16 x 16 dots in units of 8 dots.

This display output can be combined with the TV picture signal or the VTR output signal, and that combined image can be recorded to a VTR.

10-2. Terminal connection diagram



10-3. Block diagram



CIRCUIT DESCRIPTION

10-4. Explanation of terminals

Symbol	Pin No.	I/O	Function
EXtal	10	I	Pins to externally connect the dot clock pulse generator.
Xtal	9	O	
Reset	21	I	TVDC reset input. With Reset "L", TVDC is initialized. For power ON, the vertical sync signal must be input to the VSYNC pin. Hysteresis input.
HSYNC	5	I	Horizontal sync signal input. Hysteresis input.
VSYNC	6	I	Vertical sync signal input. Hysteresis input.
CS	19	I	Chip select input, which becomes "L" for serial transfer. Hysteresis input.
SCLK	18	I	Shift clock pulse input for serial transfer. Hysteresis input. (At its rise, SI read in.)
SI	17	I	Data input for display control. Hysteresis input. (8-bit serial data)
VIN	14	I	Video signal input. (Analog input)
CLVL	13	I	Character level input. (Analog input)
VOM	12	O	Combined signal output of video signal, character signal and outline or background signal. (Analog output)
VOC	3	O	Character signal output.
VOB	4	O	Outline or background signal output.
EXsc	8	I	Pins to externally connect color burst (7.15909MHz or 14.31818MHz) clock pulse generator.
Xsc	7	O	Also used to generate the internal sync signal for video mode 2.
CB	20	I	Selection between existence and nonexistence of color burst signal when video mode 2 is engaged.
PLVL	16	I	Pedestal level input, which when video mode 2 is engaged serves to match the pedestal level of the internal simple video signal and that of the external video signal.
Vcc	22	I	+5V power supply external connection pin.
Vss	11	I	Ground pin.
Test 1	1	O	Chip test pin.
Test 2	2	O	Normally open.

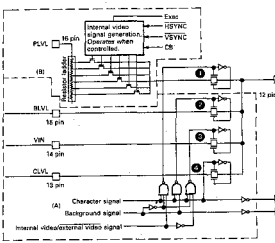
10-5. For superimposing characters in external video signal

The video signal input from pin 14 is output to pin 12 (VOM) through analog switch ❸, in which way analog switch ❸ turns OFF and switch ❷ turns ON at a position at which characters are superimposed.

At this time, the voltage at pin 15 is output to VOM. When this voltage level is lower, the black signal appears.

Subsequently, switch ❷ turns OFF and ❹ turns ON. Thus, the level of pin 13 is higher than pin 15, in which case a signal near to white appears.

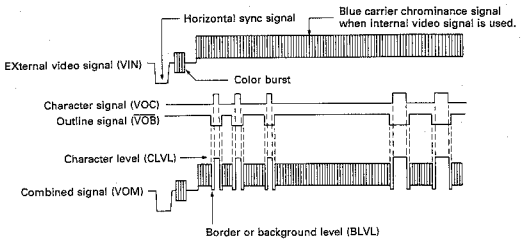
Like this, by the ON/OFF operation of analog switches ❷, ❸ and ❹, signals of two different levels (character signal and character outline signal) are superimposed on the video signal.



CIRCUIT DESCRIPTION

10-6. For generating internal video signal

When no video signal is input, an IC generates video signal to output it. At this time, analog switch ❶ turns ON and the rest turn OFF. The internal video signal is generated from the dividing process of frequency 7.15909MHz (twice the frequency of the color subcarrier).

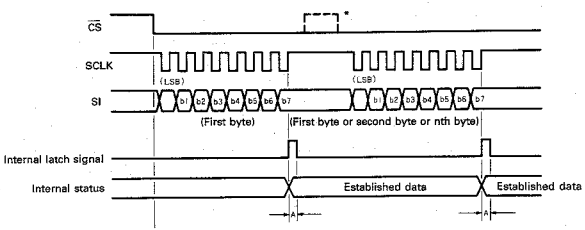

Horizontal sync signal
Blue carrier chrominance signal when internal video signal is used.
EXternal video signal (VIN)
Color burst
Character signal (VOC)
Outline signal (VOB)
Character level (CLVL)
Combined signal (VOM)
Border or background level (BLVL)

10-7. Fata transfer method and command write method

The display control command and data writing is performed in a manner of 8-bit serial transfer.

For serial transfer, the $\overline{CS}$ pin is made "L". While the $\overline{CS}$ pin is "L", any data whatever in the first byte, the second byte ... the nth byte of each command can be transferred.

The data, of 8-bit length, is shifted and input to the SI pin in order from the LSB. As shown in figure, at the rise of the shift clock pulse input to the SCLK pin, data is taken in and shifted. At the rise of a shift clock pulse corresponding to the eighth bit, the transferred data is latched in.



* There is another available method.
For byte synchronization, the $\overline{CS}$ pin is returned to "H" once during serial date transfer, after which the $\overline{CS}$ pin is set to "L" again.

Serial transfer timing

CIRCUIT DESCRIPTION

11. LA2770 Monolithic Linear Integrated Circuit

Dolby Pro-logic Surround Matrix Decoder (X08-233X-XX : IC12)

11-1 Outline:

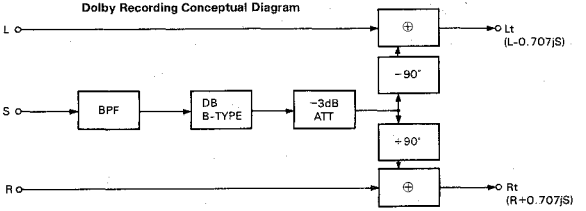
LA2770, a decoder IC for Dolby pro-logic surround system, contains every feature for the adaptive matrix and center mode control of this system.
The two channel inputs subjected to Dolby surround encoding are decoded into four channel signals of L-ch, C-ch, R-ch and S-ch. A perfect Dolby pro-logic surround decoder can be constituted owing to a combination with an input balancer noise sequencer, delay circuit, 7 kHz low pass filter, modified Dolby NR, and output master level control.

11-2 Features:

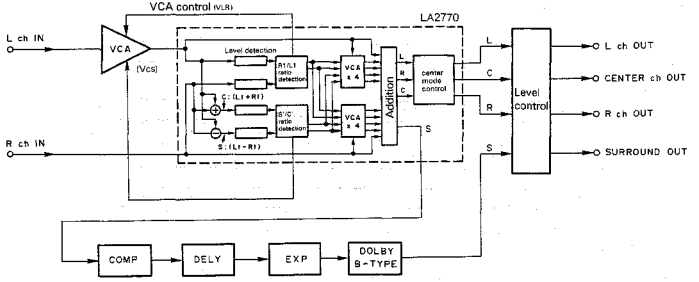
- Every feature of adaptive matrix (input buffer, BPF, full-wave rectifier, log-difference amplifier, threshold switch, dual time constant, polarity splitter, VCA, combining network) is contained.
- Center mode selection (Normal/Phantom/Wide)
- Center ON/OFF selection
- SUR OFF mode

11-3 Dolby Pro-logic Operation

Dolby Recording Conceptual Diagram

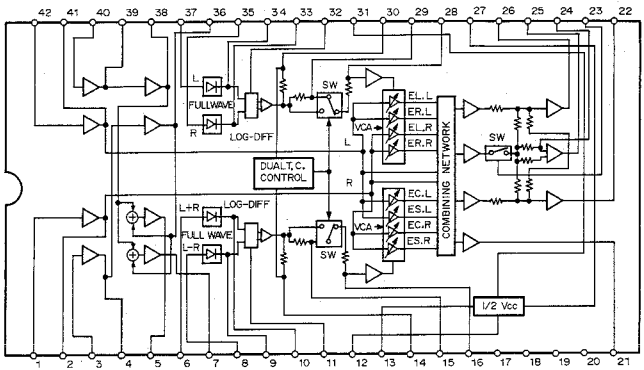


Dolby Pro-logic Block Diagram



CIRCUIT DESCRIPTION

11-4. Block diagram



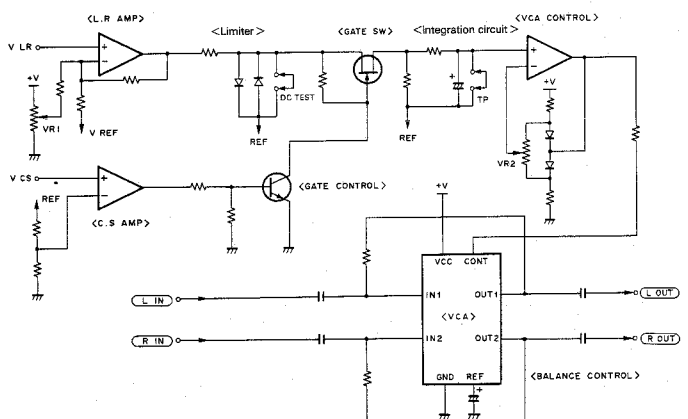
LA2770 Pin Functions

Pin No.	Description	Pin No.	Description
1	R-ch input	22	R-ch output
2	R-ch input amplifier output	23	Center ON/OFF switch (GND: OFF)
3	R-ch control signal BPF input	24	Center mode switch (ON/Phantom/Wide)
4	R-ch control signal BPF output	25	C-ch output
5	C-ch control signal output	26	L-ch output
6	C-ch control signal input	27	1/2 Vcc. (AC GND)
7	S-ch control signal output	28	R/L-ch time-constant (F) setting capacitor
8	S-ch control signal input	29	R/L-ch time-constant (S) setting capacitor
9	S-ch full-wave rectification output	30	R/L-ch dual time-constant timing setting capacitor
10	C-ch full-wave rectification output	31	Vcc
11	S/C-ch log-difference amplifier input capacitor	32	R/L-ch log-difference amplifier input capacitor
12	GND	33	R-ch full-wave rectification output
13	V ref (1/2 Vcc)	34	L-ch full-wave rectification output
14	S/C-ch dual time-constant timing setting capacitor	35	R-ch control signal input
15	S/C-ch time-constant (S) setting capacitor	36	L-ch control signal output
16	S/C-ch time-constant (F) setting capacitor	37	L-ch control signal input
17	Surround OFF (L-ch/C-ch/R-ch steering) mode switch (GND: OFF)	38	L-ch control signal output
18	NC	39	L-ch control signal BPF output
19	NC	40	L-ch control signal BPF input
20	NC	41	L-ch input amplifier output
21	S-ch output	42	L-ch input

CIRCUIT DESCRIPTION

Auto Balance Operation (X13-6440-10)

To the pin 32 of IC2 (X08), VLR (L/R DC level) is output and, to the pin 11, Vcs (center surround DC level). The auto balance circuit is controlled by these voltages.
VLR, the front L/R level balance voltage, is identical with the reference voltage when L-ch and R-ch are the same in voltage level. The former voltage is subject to averaging in an integration circuit and comparison with the reference voltage. Then, the difference voltage serves for VCA control.
However, it is when Vcs is higher than Vref, i.e. when L+R level is given that the control voltage passes the FET gate. Namely, when the L-ch and R-ch signals are in phase and the same in level, the auto balance circuit operates.
In addition, the VCA control level is regulated to ±3 dB. The L-ch only can be controlled.

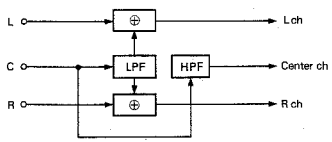


CIRCUIT DESCRIPTION

Center Mode Control

(1) Normal Mode

Much of low-frequency monaural components is given. When signals are regenerated as they are, low-frequency sounds will be heard from the center speaker. At this time, the use of a low-diameter speaker for center may results in insufficient low-frequency sound.
To avoide this, low-frequency components of less than 100 Hz are divided to the left and right channels from the center channel.



(2) Wide mode

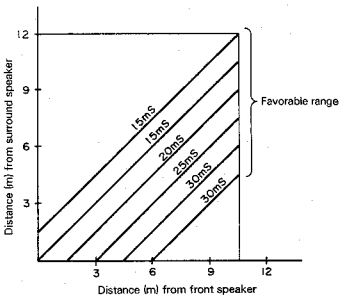
Without the application of the process of the normal mode, the C-ch and L-ch and R-ch signals are output as they are. For this reason, the center speaker needs to emit sufficient low- friquency sounds.
In addition, in use of a sub-woofer system, the normal mode is engaged.

(3) Phantom mode

Without the center speaker, the C-ch component is divided by two to the left and right channels.

(4) Center OFF

The center channel is only set OFF and no other process is performed. Therefore, a monaural sound is not emitted from any channel. This mode is used for testing such as level check, etc.



Relationship between Speaker Setting Location and Delay Time

ADJUSTMENT

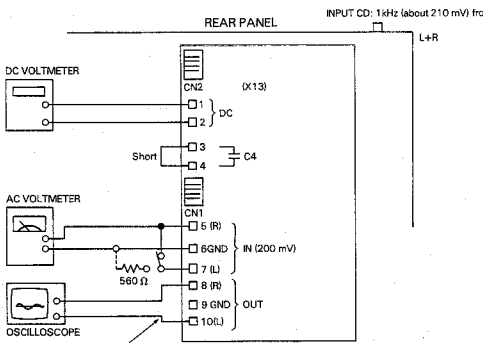
No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	TUNER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
FM	SECTION	SELECTOR: FM					
1	DETECTOR	(A) 98.0MHz 1kHz,±75kHz dev 60dBu(ANT input)	Connect a DC voltmeter between TP3 and TP4.	AUTO or MONO 98.0MHz	L4 (X05-)	0V	(a)
2	DISTORTION (MONO)	(C) 98.0MHz 1kHz,±68.25kHz dev Selector:L or R Pilot:±6.75kHz dev 66dBu(ANT input)	(B)	98.0MHz	L5 (X05-)	Minimum distortion.	
3	VCO	(A) 98.0MHz 0 dev 100dBu(ANT input)	Connect a frequency counter between TP5 and GND.	AUTO 98.0MHz	VR3 (X05-)	19.00kHz	(b)
4	DISTORTION (STEREO)	(C) 98.0MHz 1kHz,±68.25kHz dev Selector:L or R Pilot:±6.75kHz dev 60dBu(ANT input)	(B)	98.0MHz	IFT (Front end)	Minimum distortion.	
5	SEPARATION (E Type)	(C) 98.0MHz Stereo signal 60dBu(ANT input)	(B)	AUTO 98.0MHz	VR4 (X05-)	Minimum crosstalk.	
6	TUNING LEVEL	(A) 98.0MHz 0 dev 14dBu(ANT input) 75Ω	(B)	AUTO or MONO 98.0MHz	VR1 (X05-)	Adjust VR1 and stop at the point where FL1(TUNED) goes on.	
AM	SECTION	Keep the AM loop antenna installed. SELECTOR: AM					
(1)	BAND EDGE (Low)	-	Connect a DC voltmeter between TP1(GND) and TP2.	-	L9 (X05-)	1.5V	(c)
(2)	BAND EDGE (High)	-	Connect a DC voltmeter between TP1(GND) and TP2.	-	TC2 (X05-)	8.2V	(c)
		Repeat alignments (1) and (2) several times.					
(3)	RF ALIGNMENT (1)	(B) 600kHz 20dBu(ANT input)	(B)	-	L8 (X05-)	Maximum amplitude and symmetry of the oscilloscope display.	
(4)	RF ALIGNMENT (2)	(D) 1400kHz 10dBu(ANT input)	(B)	-	TC1 (X05-)	Maximum amplitude and symmetry of the oscilloscope display.	
		Repeat alignments (3) and (4) several times.					
(5)	IF TRANSFORMER	(D) 1000kHz 22dBu(ANT input)	(B)	-	L10 (X05-)	Maximum amplitud and symmetry of the oscilloscope display.	
(6)	TUNING LEVEL	(D) 1000kHz 35dBu(ANT input)	(B)	-	VR2 (X05-)	Adjust VR2 and stop at the point where FL1(TUNED) goes on.	
AUDIO	SECTION						
[1]	IDLE CURRENT	-	(E) Connect a DC voltmeter across CP1(L) CP2(R)	Volume: 0	VR1(L) VR2(R) (X59-)	10mV	(d)
[2]	SURROUND PRO LOGIC ADJUSTMENT	-	Connect a AC voltmeter between TP10 and GND.	TEST TONE ON	VR1 (X08-)	Noise level 80mV	(e)

ADJUSTMENT

〈AUDIO SECTION〉

No.	ITEM	INPUT-SIDE SETTING	OUTPUT-SIDE SETTING	CONDITIONS	ADJUSTED WITH	ADJUSTMENT METHOD	FIGURE
[3]	AUTO BALANCE ADJUSTMENT(1)	Input AC 1kHz signal to the CD terminal. (same level for L and R)	Set the input level of (X13-6440) TP⑦(L) and TP⑪(R) to 250mV as measured with an AC voltmeter. Short the line between TP⑦-⑤ to provide the same level for L and R.	PRO-LOGIC:ON CENTER MODE: OFF Short the line between TP⑦-④ to bypass C4.	VR2 (X13-6440)	Minimize the difference in output level between TP⑩(L) and TP⑭(R). Connect TP⑩ and ⑫ to "+" and "-" on oscilloscope.	Fig. 1
[4]	AUTO BALANCE ADJUSTMENT(2)	〃	Same as above. Insert a DC voltmeter between TP① and ②.	〃	VR1 (X13-6440)	Minimize the deflection of DC voltmeter. (within ±5mV)	

※ After adjustments [3] and [4], check the auto balancing as follows; open the circuit of TP③-④, remove the shorting between TP-⑦-⑤, and insert 560 between TP⑦-⑧ (or TP⑤-⑥) to create an input level difference between L and R. An output level defference is momentarily produced between TP⑩-⑫, but it disappears as a result of the balancing operation.



REGLAGE

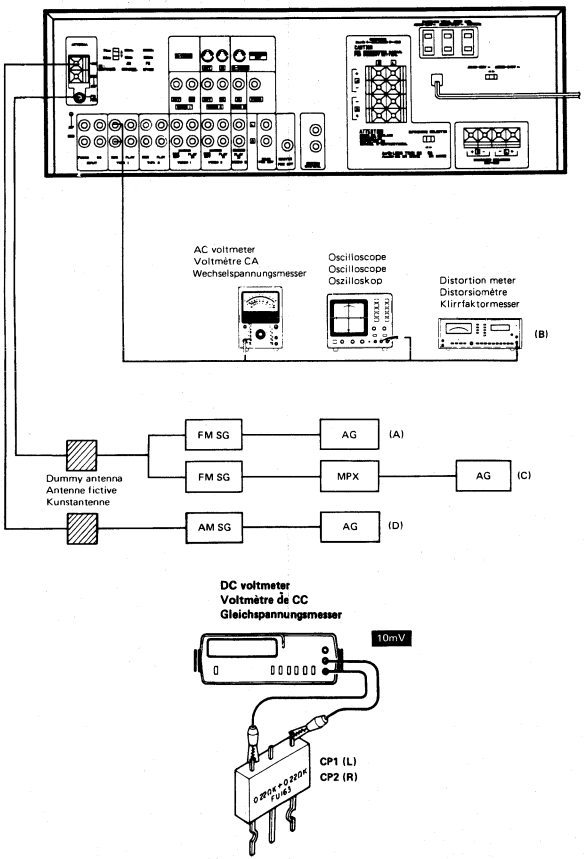
N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DU TUNER	POINT DE L'ALIGNEMENT	ALIGNER POUR	FIG.
SECTION MF			SELECTEUR : FM				
1	DETECTEUR	(A) 98.0MHz 1kHz.±75kHz dev 60dBu(Entrée ANT)	Relier un voltmètre CC entre les TP3 et TP4.	AUTO ou MONO 98.0MHz	L4 (X05-)	0V	(a)
2	DISTORSION (MONO)	(C) 98.0MHz 1kHz.68.25kHz dév Selection:l ou R Signal pilote: ±6.75kHz dév 60dBu(Entrée ANT)	(B)	98.0MHz	L5 (X05-)	Distorsion minimale.	
3	OSCILLATEUR CONTROLE PAR LA TENSION	(A) 98.0MHz 0 dev 100dBu(Entrée ANT)	Relier un compteur de fréquence entre les TP5 et GND.	AUTO 98.0MHz	VR3 (X05-)	19.00kHz	(b)
4	DISTORSION (STEREO)	(C) 98.0MHz 1kHz.68.25kHz dév Selection:l ou R Signal pilote: ±6.75kHz dév 60dBu(Entrée ANT)	(B)	98.0MHz	Tête H.F. IFT (X05-)	Distorsion minimale.	
5	SEPARATION (E type)	(C) 98.0MHz Signal stéréo 60dBu(Entrée ANT)	(B)	AUTO 98.0MHz	VR4 (X05-)	Diaphonie minimale.	
6	NIVEAU D'ACCORDER	(A) 98.0MHz 0 dev 14dBu(Entrée ANT) 75Ω	(B)	AUTO ou MONO 98.0MHz	VR1 (X05-)	Ajuster VR1 et arrêter le mouvement de VR1 au moment où le FL1(TUNED)s'allume.	
SECTION MA		Laisser l'antenne bouche MA installée.			SELECTEUR: AM		
(1)	BORD DE BANDE (Bas)	-	Relier un voltmètre entre les TP1(GND) et TP2.	-	L3 (X05-)	1.5V	(c)
(2)	BORD DE BANDE (Haut)	-	Relier un voltmètre entre les TP1(GND) et TP2.	-	TC2 (X05-)	8.0V	(c)
Répéter les points (1) et (2) plusieurs fois.							
(3)	ALIGNEMENT H.T. (1)	(D) 600kHz 20dBu(Entrée ANT)	(B)	-	L8 (X05-)	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
(4)	ALIGNEMENT H.T. (2)	(D) 1400kHz 20dBu(Entrée ANT)	(B)	-	TC1 (X03-)	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
Répéter les points (3) et (4) plusieurs fois.							
(5)	TRANSFORMATEUR F.I.	(D) 1000kHz 20dBu(Entrée ANT)	(B)	-	L10 (X05-)	Amplitude et symétrie maximale de l'affichage de l'oscilloscope.	
(6)	NIVEAU D'ACCORDER	(A) 1000kHz 35dBu(Entrée ANT)	-	-	VR2 (X05-)	Ajuster VR2 et arrêter le mouvement de VR2 au moment où le FL1(TUNED)s'allume.	
SECTION AUDIO							
[1]	COURANT DE POLARISATION	-	(E) Connecter un voltmètre CC sur CP1(L) CP3(R)	Volume: 0	VR1(G) VR2(D) (X09-)	10mV	(d)
[2]	SURROUND PRO LOGIC	-	Relier un voltmètre CA entre les TP10 et GND.	Fréquence de mesure ON	VR1 (X08-)	Niveau de bruit 60mV	(e)

ABGLEICH

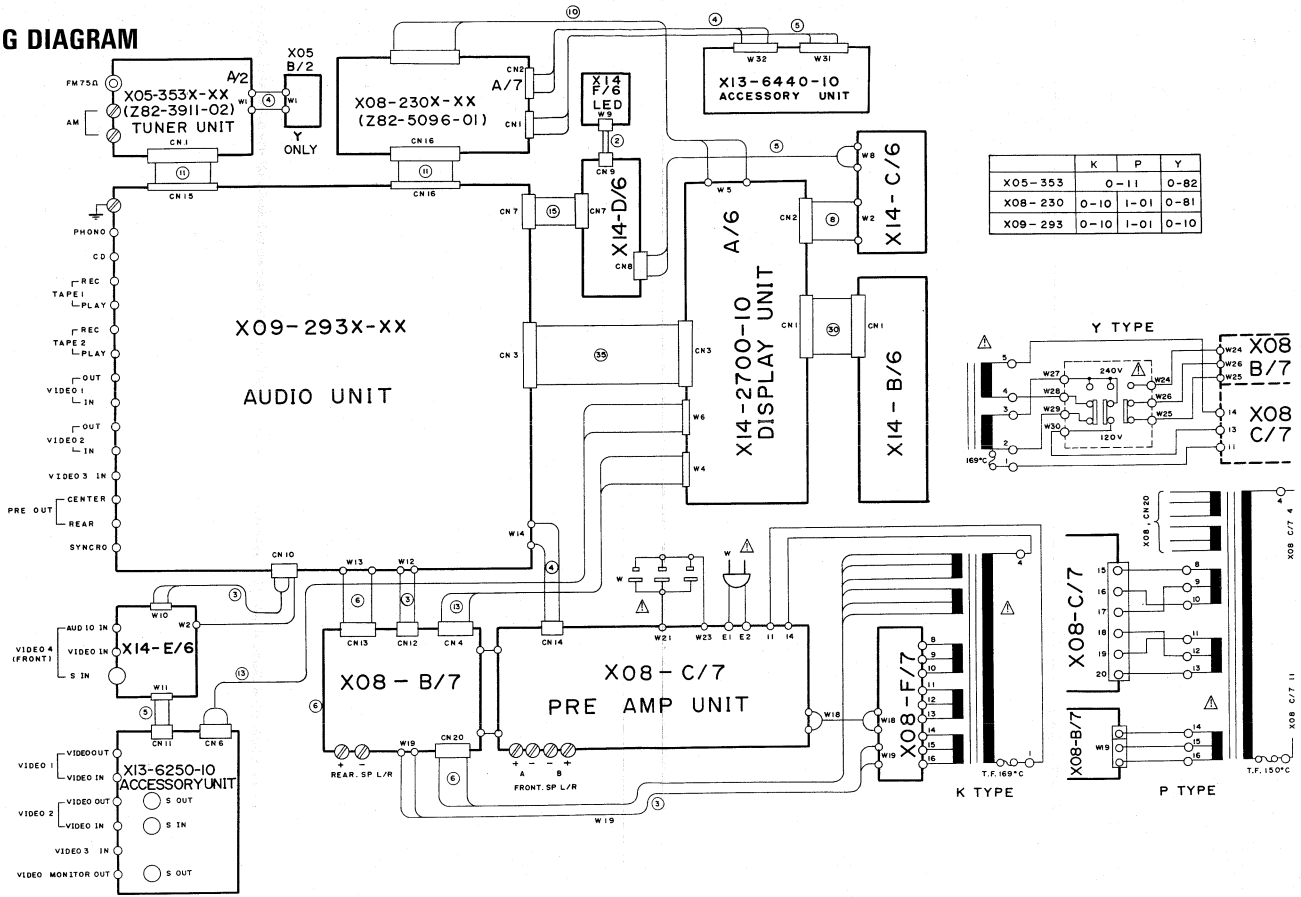
NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	TUNER-EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
UKW-EMPFANGSABTEILUNG			WÄHLER: FM				
1	DETEKTOR	(A) 98.0MHz 1kHz,±75kHz Hub 60dBu(ANT-Eingang)	Einen Gleichspannungs-messer zwischen TP3 und TP4 anschließen.	AUTO oder MONO 98.0MHz	L4 (X05-)	0V	(a)
2	KLIRRFAKTOR (MONO)	(C) 98.0MHz 1kHz,±68,25kHz Hub Wähler: L oder R Pilotton: ±6.75kHz Hub 60dBu(ANT-Eingang)	(B)	98.0MHz	L5 (X05-)	Minimal Klirrfaktor.	
3	SPANNUNGS-GEREGELTER OSZILLATOR	(A) 98.0MHz 0 Hub 100dBu(ANT-Eingang)	Einen Frequenzzähler zwischen TP5 und GND anschließen.	AUTO 98.0MHz	VR3 (X05-)	19.00kHz	(b)
4	KLIRRFAKTOR (STEREO)	(C) 98.0MHz 1kHz,±68,25kHz Hub Wähler: L oder R Pilotton: ±6.75kHz Hub 60dBu(ANT-Eingang)	(B)	98.0MHz	Frontend IFT (X05-)	Minimal Klirrfaktor.	
5	STEREO KANAL TRENNUNG (E Type)	(C) 98.0MHz Stereo Signal 60dBu(ANT-Eingang)	(B)	AUTO 98.0MHz	VR4 (X05-)	Minimal Klirrfaktor.	
6	ABSTIMM PEGEL	(A) 98.0MHz 0 Hub 14dBu(ANT-Eingang) 75Ω	(B)	AUTO oder MONO 98.0MHz	VR1 (X05-)	Den Pegel wiederstand aufdrehen, und dem VR1 halt geben wobei den FL1(TUNED) anzeiger leuchtet wird.	
MW-EMPFANGSABTEILUNG			Die MW-Rahmenantenne angebracht lassen.		WÄHLER: AM		
(1)	BANDKANTE (Niedrig)	-	Einen Gleichspannungs-messer zwischen TP1(GND) und TP2 anschließen.	-	L9 (X05-)	1.5V	(c)
(2)	BANDKANTE (Hoch)	-	Einen Gleichspannungs-messer zwischen TP1(GND) und TP2 anschließen.	-	TC2 (X05-)	8.0V	(c)
Abstimmungen (1) und (2) mehrere Male wiederholen.							
(3)	HF-ABGLEICH (1)	(D) 600kHz 20dBu(ANT-Eingang)	(B)	-	L8 (X05-)	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
(4)	HF-ABGLEICH (2)	(D) 1400kHz 20dBu(ANT-Eingang)	(B)	-	TC1 (X05-)	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
Abstimmungen (3) und (4) mehrere Male wiederholen.							
(5)	ZF-UBERTRAGER	(D) 1000kHz 20dBu(ANT-Eingang)	(B)	-	L10 (X05-)	Maximal Amplitude und Symmetrie des Oszilloskopbildes.	
(6)	ABSTIMM PEGEL	(A) 1000kHz 36dBu(ANT-Eingang)	-	-	VR2 (X05-)	Den Pegel wiederstand aufdrehen, und dem VR2 halt geben wobei den FL1(TUNED) anzeiger leuchtet wird.	
AUDIO-ABTEILUNG							
[1]	LEERLAUFSTROM	-	(E) Einen Gleichspannungs-messer über CP1(L) CP2(R) anschließen.	Volume: 0	VR1(L) VR2(R) (X89-)	10mV	(d)
[2]	SURROUND PRO LOGIC	-	Einen Wechselspannungs-messer zwischen TP10 und GND anschließen.	Meßton ON	VR1 (X09-)	Geräuschpegel 60mV	(e)

ADJUSTMENT/REGLAGE/ABGLEICH

System connections/Raccordements du système/System-Anschlusse



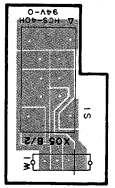
WIRING DIAGRAM



	K	P	Y
X05-353	0-11		0-82
X08-230	0-10	1-01	0-81
X09-293	0-10	1-01	0-10

PC BOARD (Component Side View)

TUNER UNIT



(c) Band edge(Low):1.5V
Band edge(High):8.0V

(b) VCO:19.00kHZ

Frequency counter

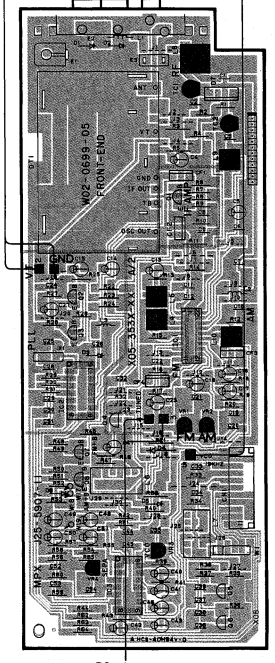
DC voltmeter

ANTENNA

AM

GND

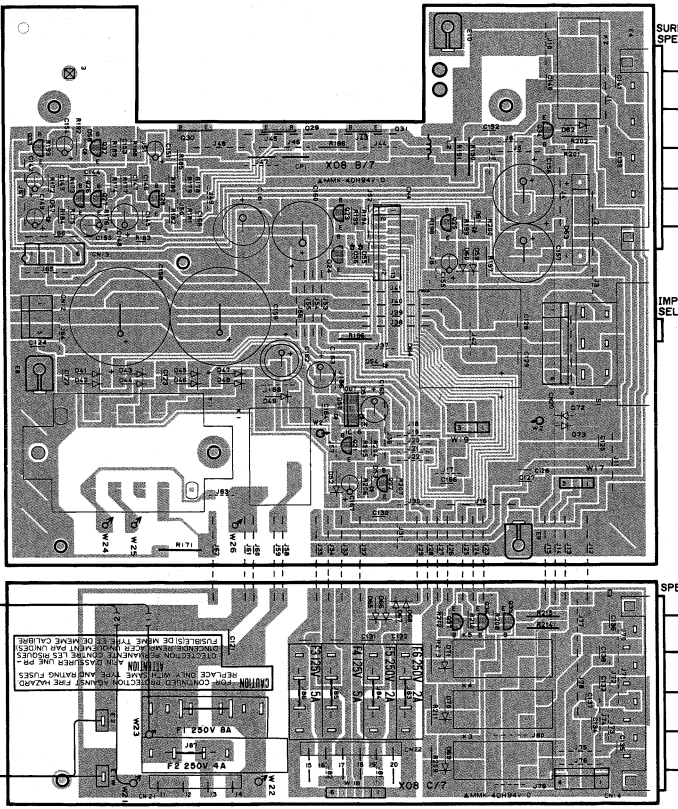
FM 75Ω



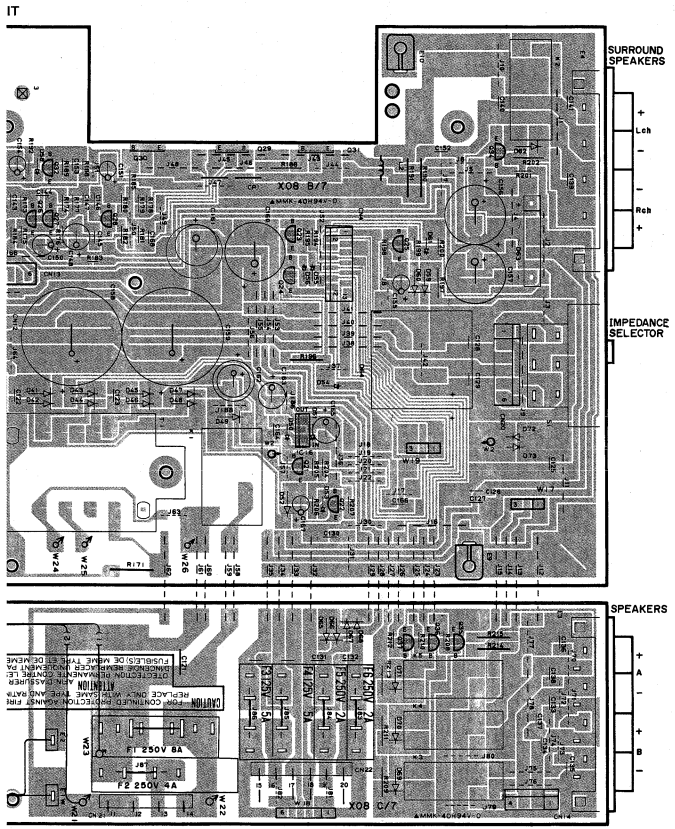
DC voltmeter

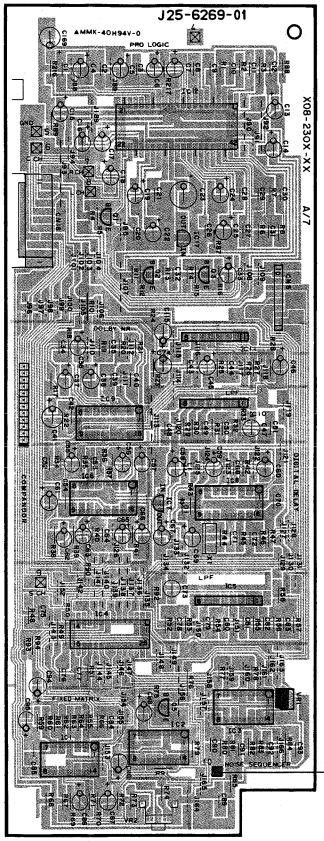
(a) Detector:0V

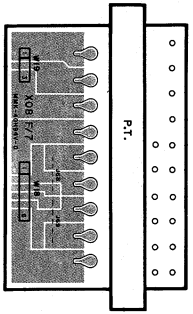
PRE-AMPLIFIER UNIT

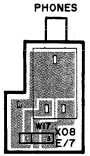


Refer to the schematic diagram for the values of resistors and capacitors.









(e) Surround PRO LOGIC
:Noise level 60mV

INPUT BALANCE

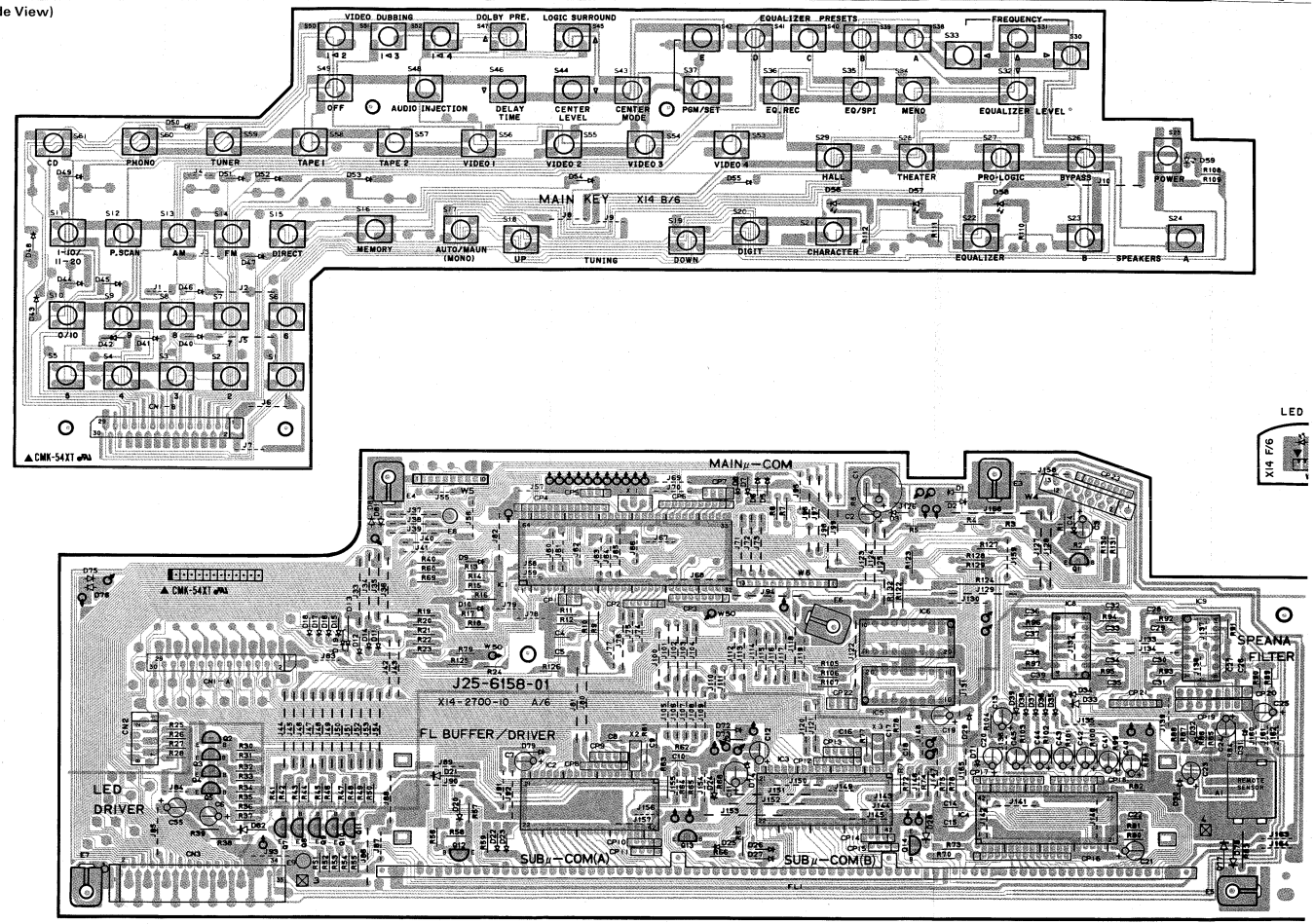
45

Refer to the schematic diagram for the values of resistors and capacitors.

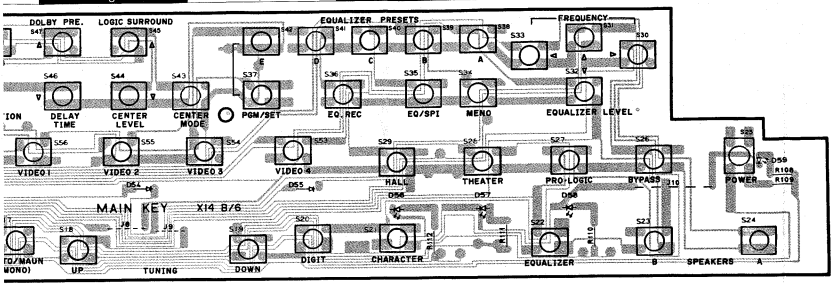
46

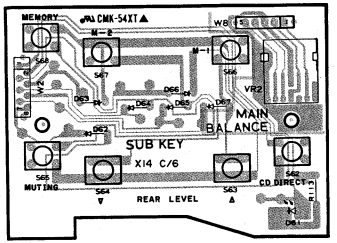
47

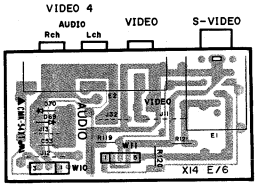
PC BOARD (Component Side View)
DISPLAY UNIT

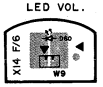


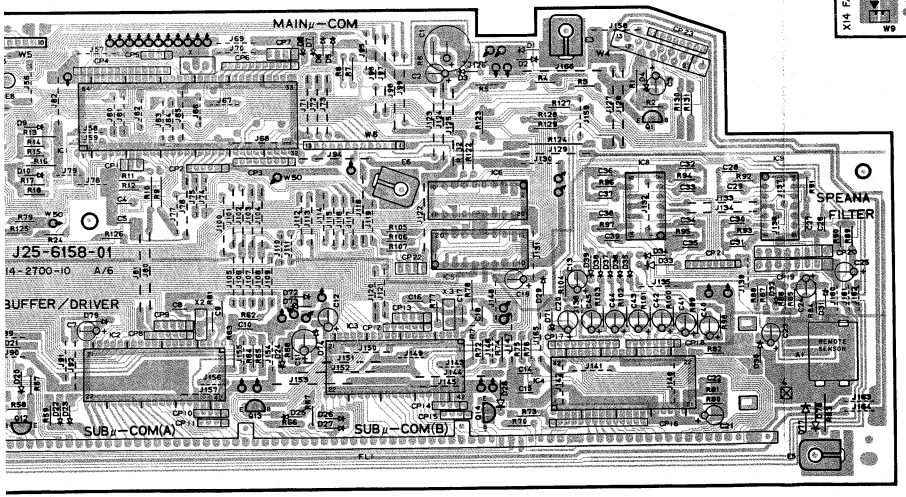
Refer to the schematic diagram for the values of resistors and capacitors.

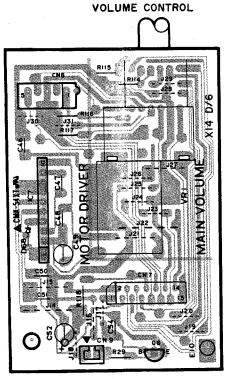








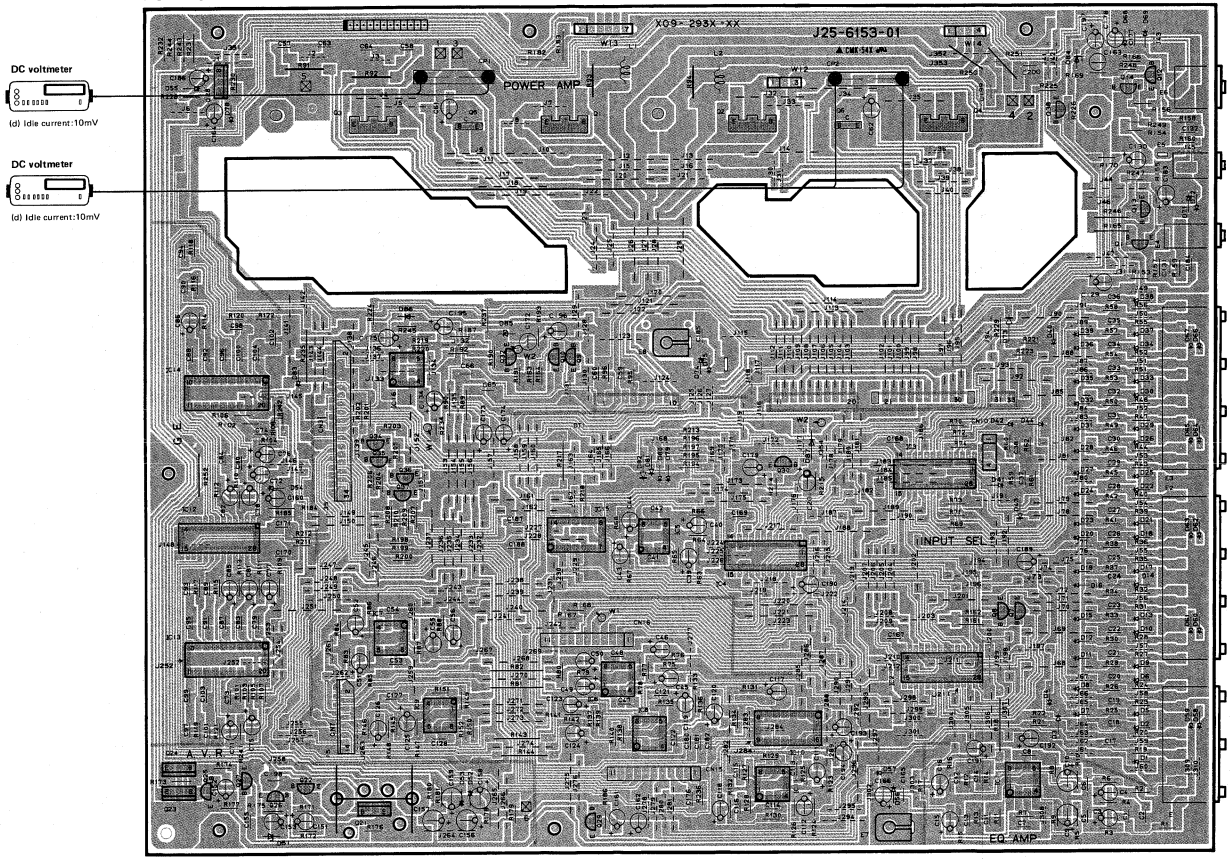




Refer to the schematic diagram for the values of resistors and capacitors.

PC BOARD (Component Side View)

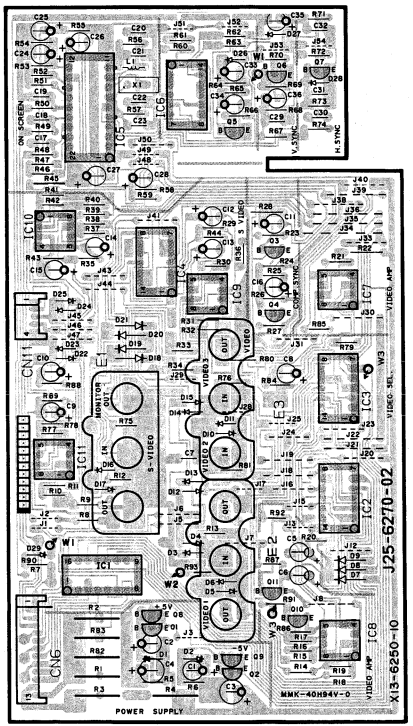
AUDIO UNIT



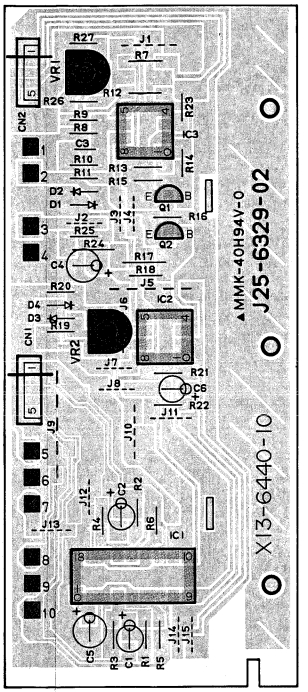
Refer to the schematic diagram for the values of resistors and capacitors.

PC BOARD (Foil Side View)

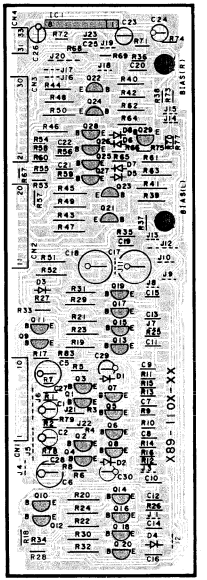
ACCESSORY UNIT



DOLBY AUDIO BIAS UNIT

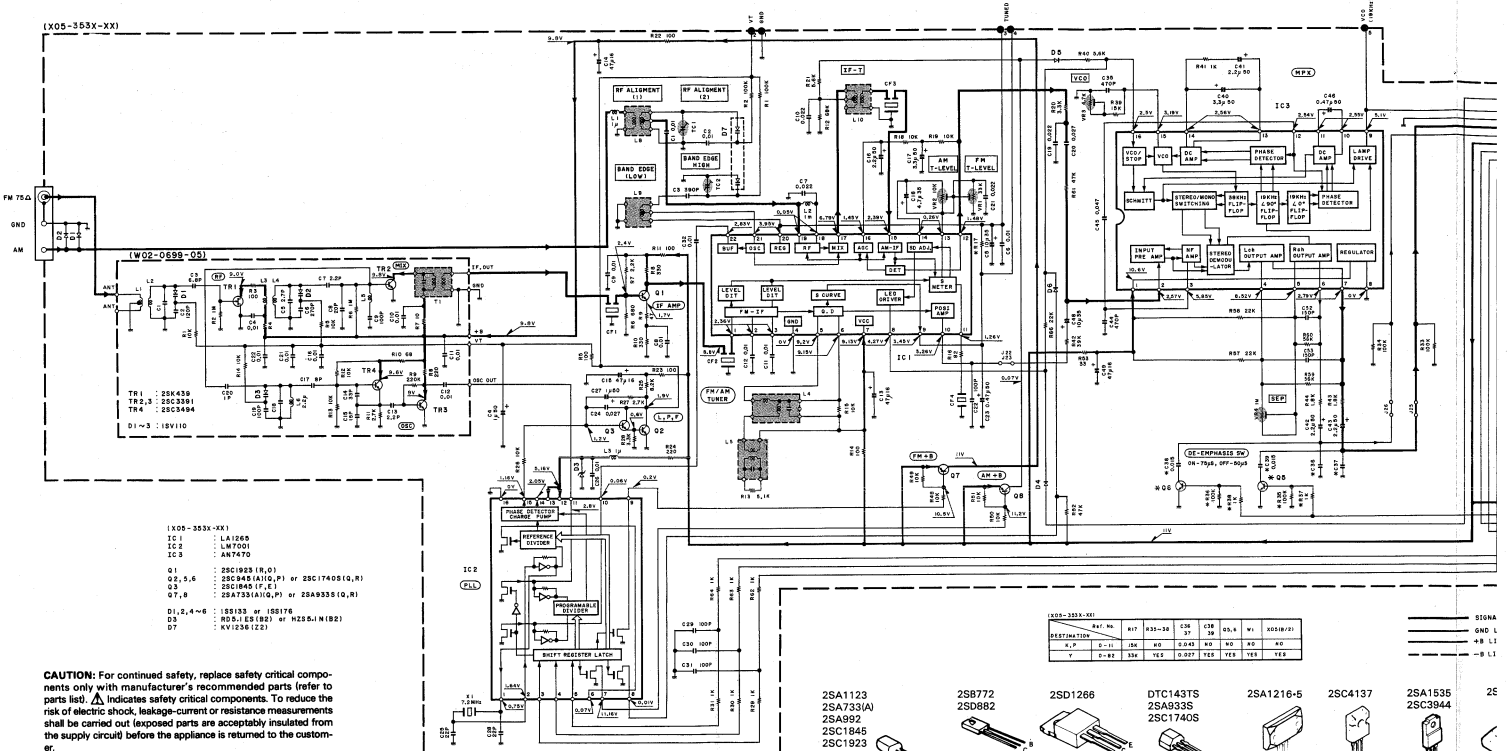


MAIN AMPLIFIER UNIT



53 54

Refer to the schematic diagram for the values of resistors and capacitors.



X05-353X-XX		Ref. No.	R17	R33~38	C36 37	C38 39	D5,6	W1	X05(B/Z)
DESTINATION									
K,P	O~11		154	KO	0.043	KO	KO	KO	KO
Y	E~B2		334	YE2	0.027	YE2	YE2	YE2	YE2

SIGNA
GND L
+B L
-B L

2SA1123
2SA733(A)
2SA992
2SC1845
2SC1923
2SC2003
2SC2631
2SC2878
2SC945(A)
2SD1302

2SB772
2SD882

2SD1266

DTC143TS
2SA933S
2SC1740S

2SA1216-5

2SC4137

2SA1535
2SC3944

2SB1253-5
2SD1893-5

NJM072BD
NJM4558D

MB88323A-K2

NJM2058D

TC4011UBP
UPC4574C
UPD4066BC
UPD4069UBC

LA2730

LM7001

AN7470
TC9176P
UPA80C
UPC1571C

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Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

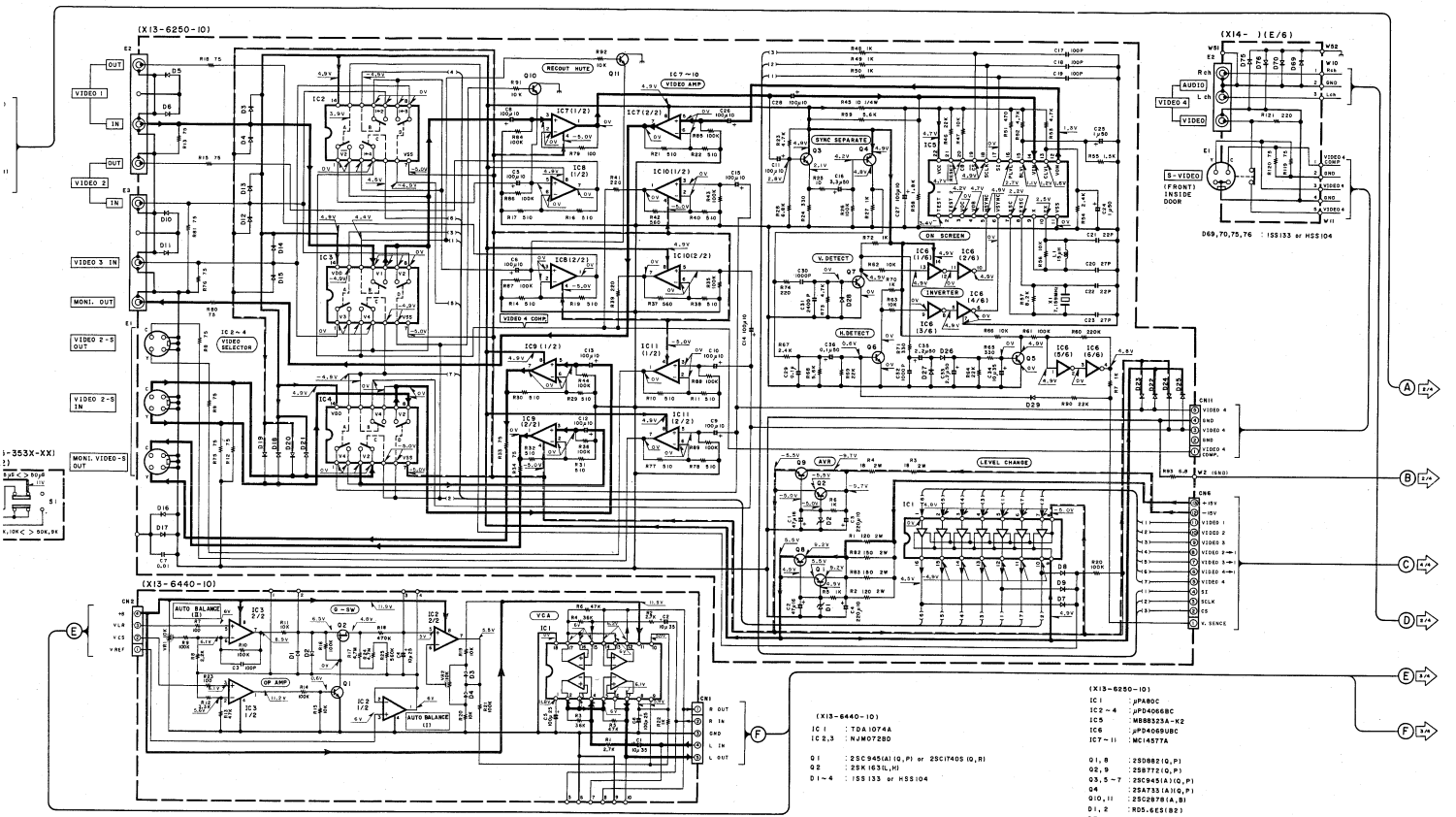
2SC4137 2SA1535 2SC3944 2SC2922•5

LM7001 AN7470 TC9176P UPA80C UPC1571C CXD1067P M5229P UPC4570C-A UPD7537ACU-220 LC7565 UPC1237HA LC7522 UPC7805HF UPC78L12J NJM78L05A 2SK163 TDA1074A LC4966 TC9162N TC9163N TC9164N LA1265 UPD75116CV

(X13-6440-10)
IC 1 : TDA1074A
IC 2,3 : NJM0728D
Q 1 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)
Q 2 : 2SK163(L,H)
D 1 ~ 4 : 1SS133 or HSS104

(X13-6250-10)
IC 1 : μPA80C
IC 2 ~ 4 : μPD4066BC
IC 5 : M88823A-K2
IC 6 : μPD4069UBC
IC 7 ~ 11 : MC14577A
Q 1, 8 : 2SD882(Q,P)
Q 2, 9 : 2SB772(Q,P)
Q 3, 5 ~ 7 : 2SC945(A)(Q,P)
Q 4 : 2SA733(A)(Q,P)
Q 10, 11 : 2SC2878(A,B)
D 1, 2 : RD5.6ES(B2)
D 3 ~ 29 : 1SS133

Y05-2490-10(1/4)



(X13-6440-10)

IC 1 : TDA1074A
IC 2,3 : NJM072SD

Q1 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)
Q2 : 2SK163(L,M)
D1~4 : 1SS133 or HSS104

(X13-6250-10)

IC 1 : μPA80C
IC 2~4 : μPD4066BC
IC 5 : M5B8323A-K2
IC 6 : μPD4069UBC
IC 7~11 : MC1457TA

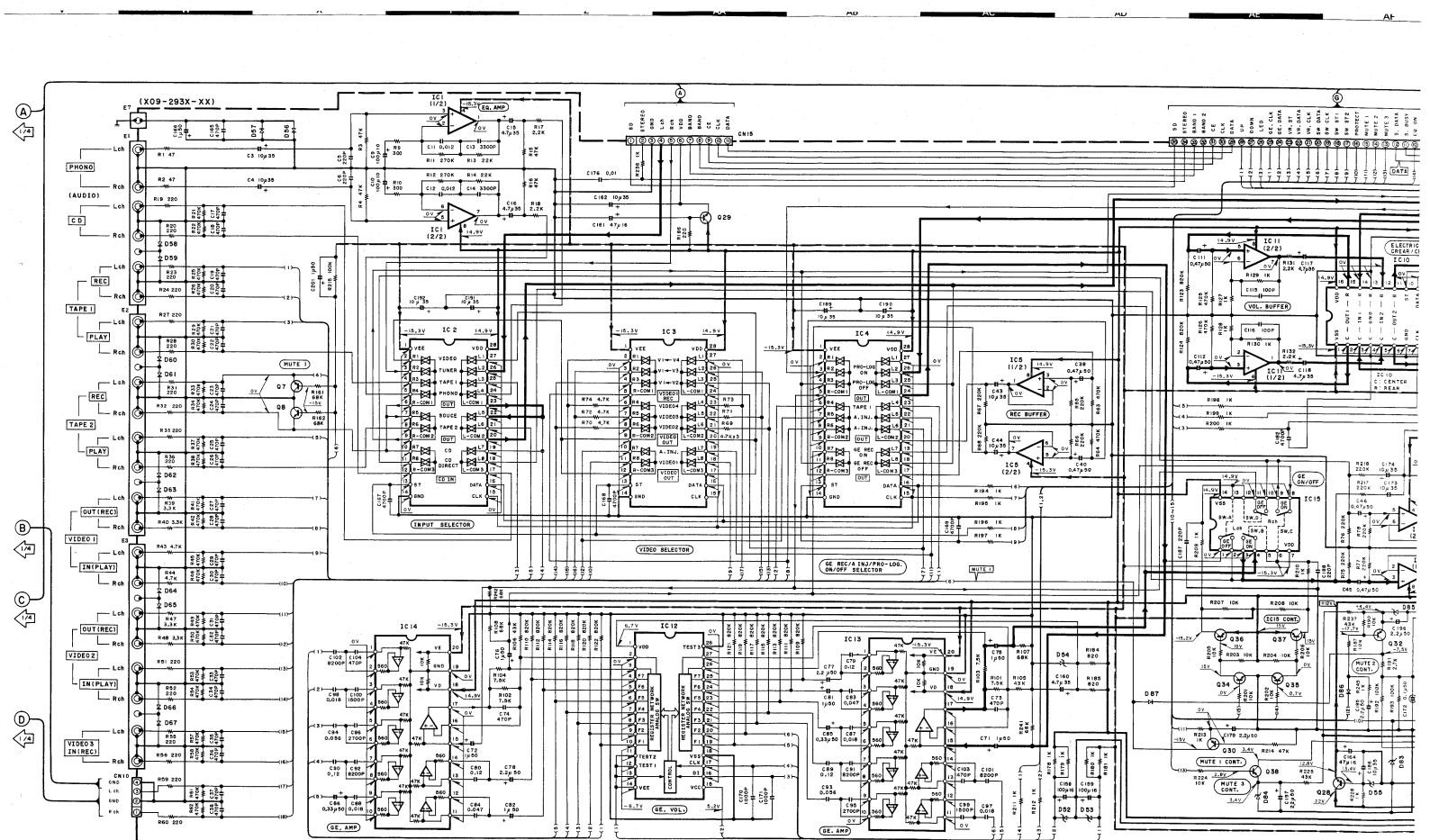
Q1, 8 : 2SD882(Q,P)
Q2, 9 : 2SB772(Q,P)
Q3, 5~7 : 2SC945(A)(Q,P)
Q4 : 2SA733(A)(Q,P)
Q10, 11 : 2SC2878(A,B)
D1, 2 : RD5.6ES(B2)
D3~29 : 1SS133

UPC4570C-A UPD7537ACU-220 LC7565 UPC1237HA LC7522 UPC7805HF UPC78L12J NJM78L05A 2SK163 TDA1074A LC4966 TC9162N TC9163N TC9164N LA1265 UPD75116CW-108 LB1641 NJM072BL NJM4565L

Y05-2490-10(1/4)

KR-V9020

KENWOOD



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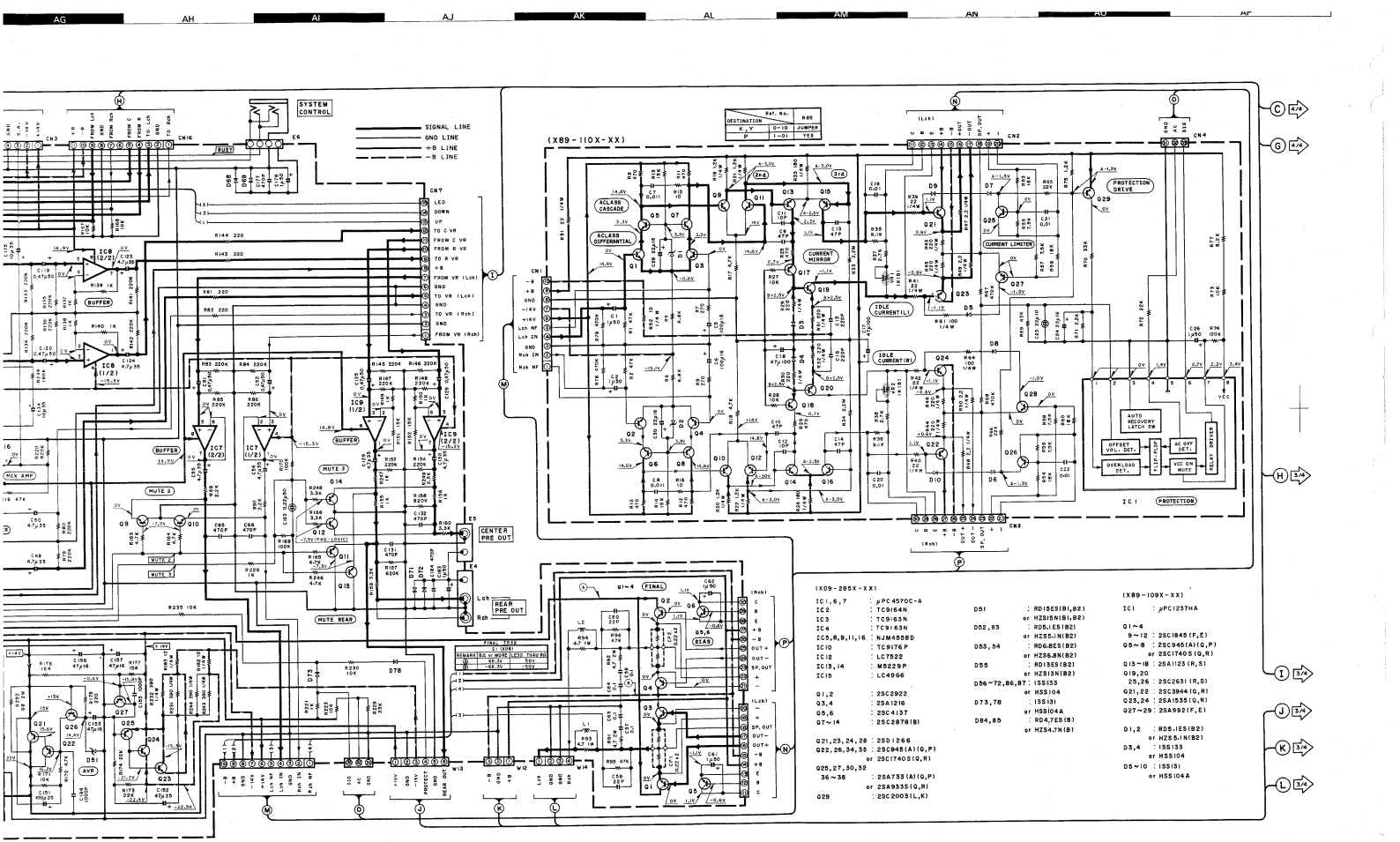
SYSTEM CONTROL
SIGNAL LINE
GND LINE
+B LINE
−B LINE
(X89-110X-XX)
ELECTRIC VOL. (LINEAR/CENTER)
VOL. BUFFER
BUFFER
MIX AMP
SE ON/OFF
MUTE 1 CONT.
MUTE 2 CONT.
MUTE 3 CONT.
IC15 CONT.
MUTE 2
MUTE 3
MUTE REAR
AVR
ACLASS CASCADE
ACLASS DIFFERANTIAL
CURRENT MIRROR
IDLE CURRENT(L)
IDLE CURRENT(R)
BIAS
FINAL
CENTER PRE OUT
REAR PRE OUT
Lch
Rch
DESTINATION
K, Y
P
Ref. No.
R85
0-10 JUMPER
1-01 YES
FINAL TR22
S1 (IOR)
REMARKED or MORE
LESS THAN
66.5V
50V
68.5V
50V
(X09-285X-XX)
IC1,6,7 : μPC4570C-A
IC2 : TC9164N
IC3 : TC9163N
IC4 : TC9163N
IC5,8,9,11,16 : NJM4558D
IC10 : TC9176P
IC12 : LC7522
IC15,14 : M52229P
IC15 : LC4966
Q1,2 : 2SC2922
Q3,4 : 2SA1216
Q5,6 : 2SC4137
Q7~14 : 2SC2878(B)
Q21,23,24,28 : 2SD1266
Q22,26,34,35 : 2SC945(A)(Q,P)
or 2SC1740S(Q,R)
Q25,27,30,32
36~38 : 2SA733(A)(Q,P)
or 2SA933S(Q,R)
Q29 : 2SC2003(L,K)



(X09-285X-XX)

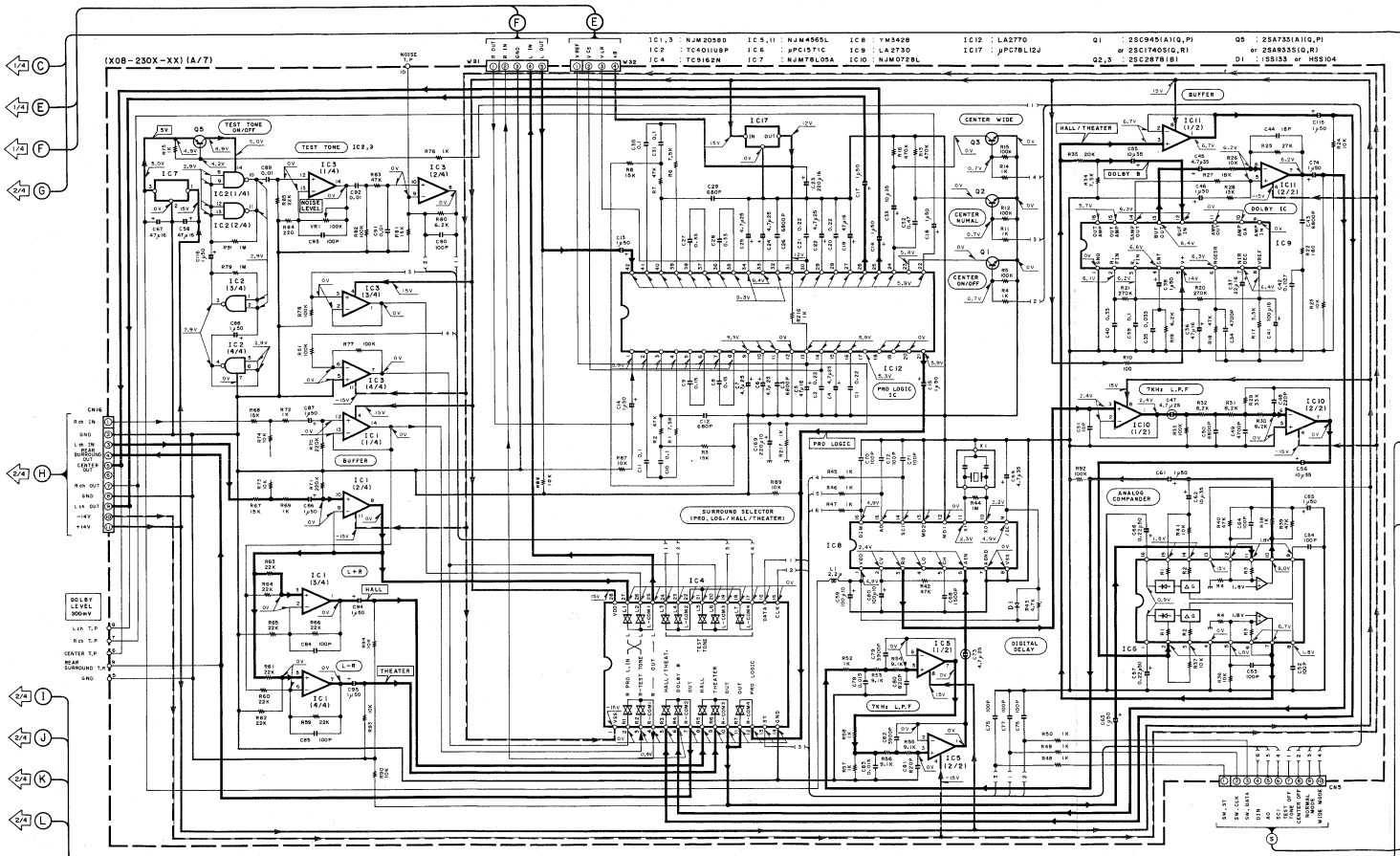
IC1,6,7	: μPC4570C-A
IC2	: TC9164N
IC3	: TC9163N
IC4	: TC9163N
IC5,8,9,11,16	: NJM4558D
IC10	: TC9176P
IC12	: LC7522
IC13,14	: M5229P
IC15	: LC4966
Q1,2	: 2SC2922
Q3,4	: 2SA1216
Q5,6	: 2SC4157
Q7~14	: 2SC2878(B)
Q21,23,24,28	: 2SD1266
Q22,26,34,35	: 2SC945(A)1(Q,P) or 2SC1740S(Q,R)
Q25,27,30,32 36~38	: 2SA733(A)1(Q,P) or 2SA933S(Q,R)
Q29	: 2SC2003(L,K)
D51	: RD15ES(B1,B2) or HZS15N(B1,B2)
D52,83	: RD5.1ES(B2) or HZS5.1N(B2)
D53,54	: RD6.8ES(B2) or HZS6.8N(B2)
D55	: RD13ES(B2) or HZS13N(B2)
D56~72,86,87	: 1SS133 or HSS104
D73,76	: 1SS133 or HSS104A
D84,85	: RD4.7ES(B1) or HZS4.7N(B1)

(X89-109X-XX)

IC1	: μPC1237HA
Q1~4 9~12	: 2SC1845(F,E)
Q5~8	: 2SC945(A)1(Q,P) or 2SC1740S1(Q,R)
Q13~18	: 2SA1123(R,S)
Q19,20 25,26	: 2SC2631(R,S)
Q21,22	: 2SC3944(Q,R)
Q23,24	: 2SA1535(Q,R)
Q27~29	: 2SA992(F,E)
D1,2	: RD5.1ES(B2) or HZS5.1N(B2)
D3,4	: 1SS133 or HSS104
D5~10	: 1SS131 or HSS104A

KR-V9020

KENWOOD



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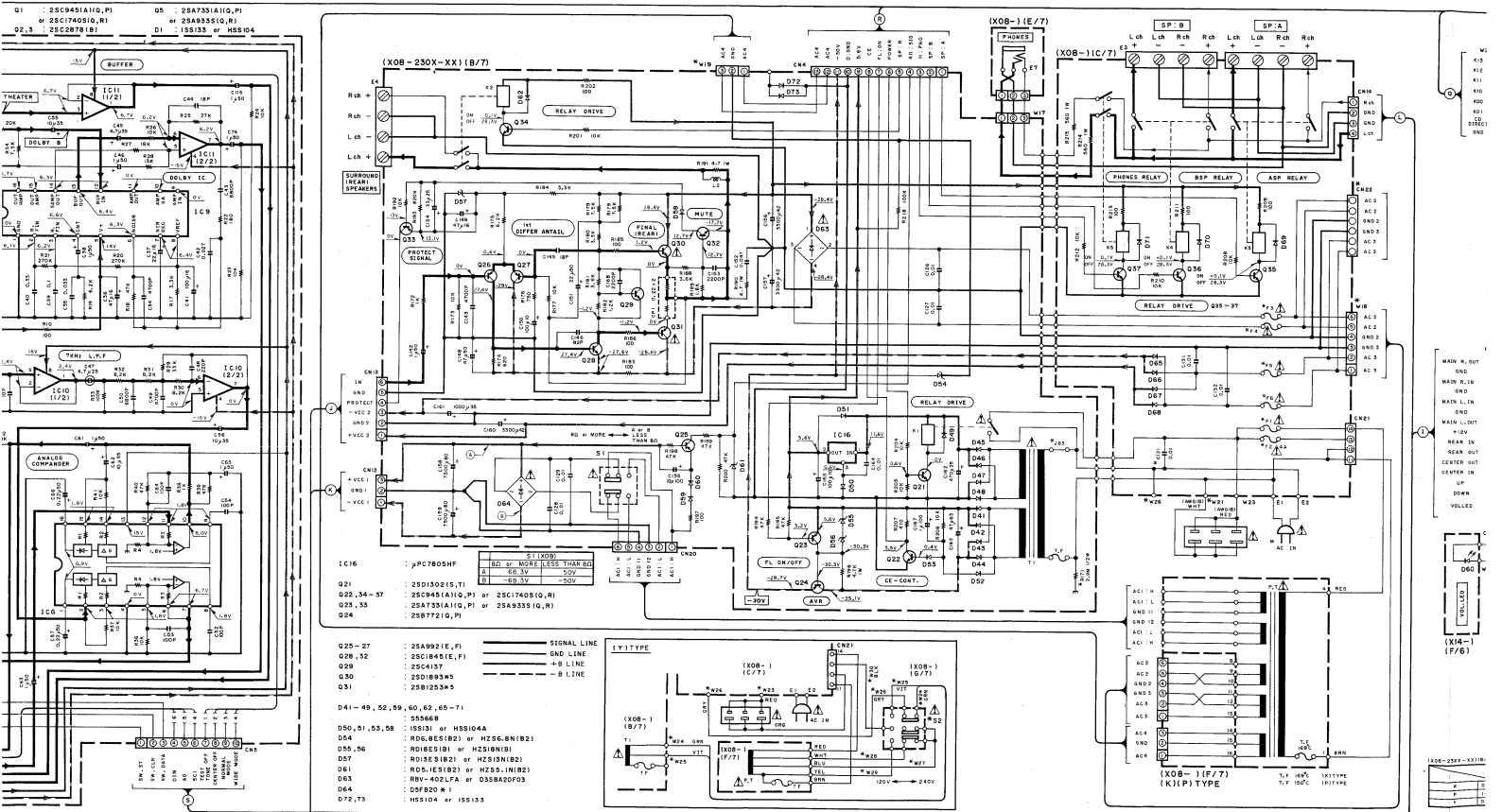
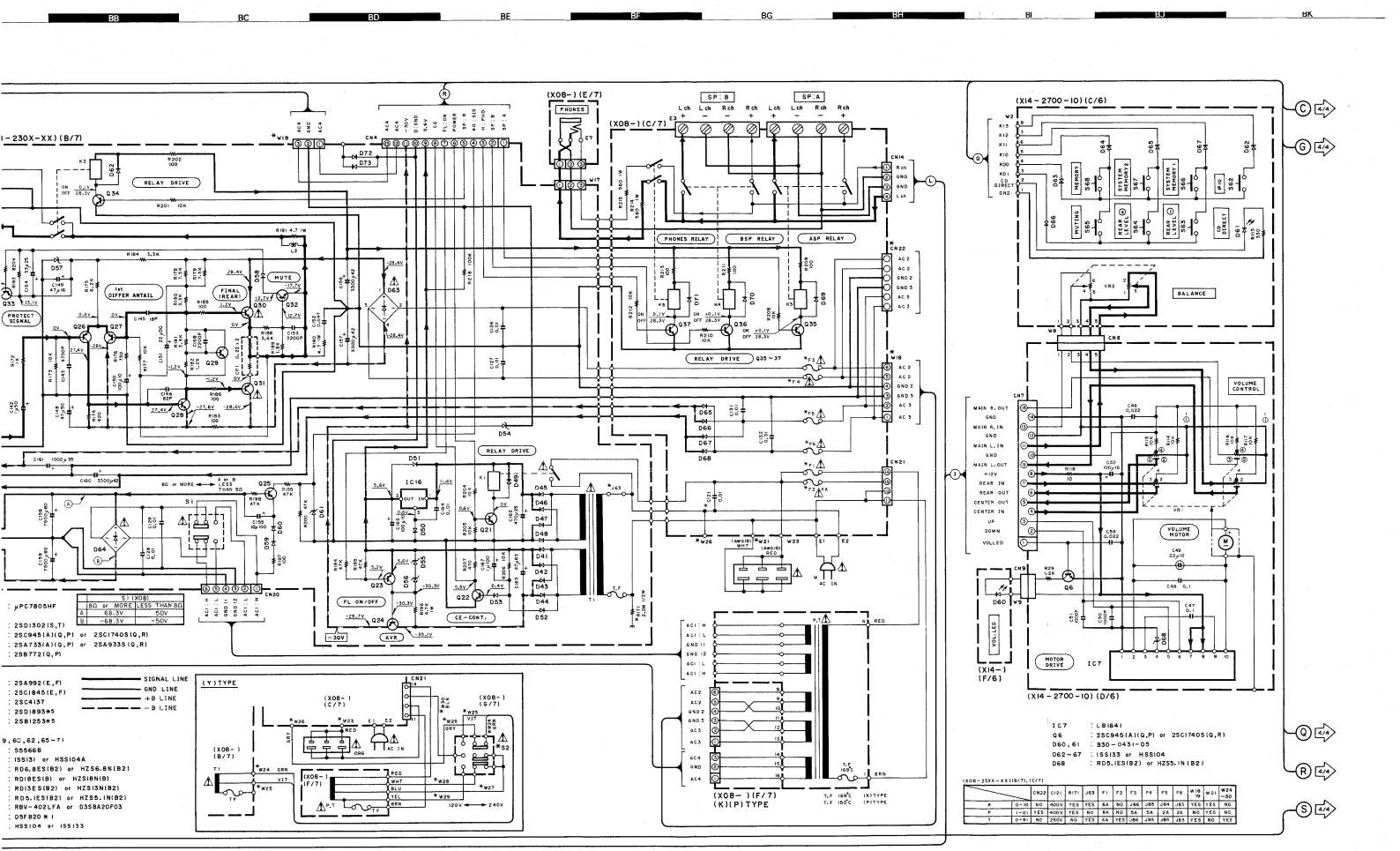
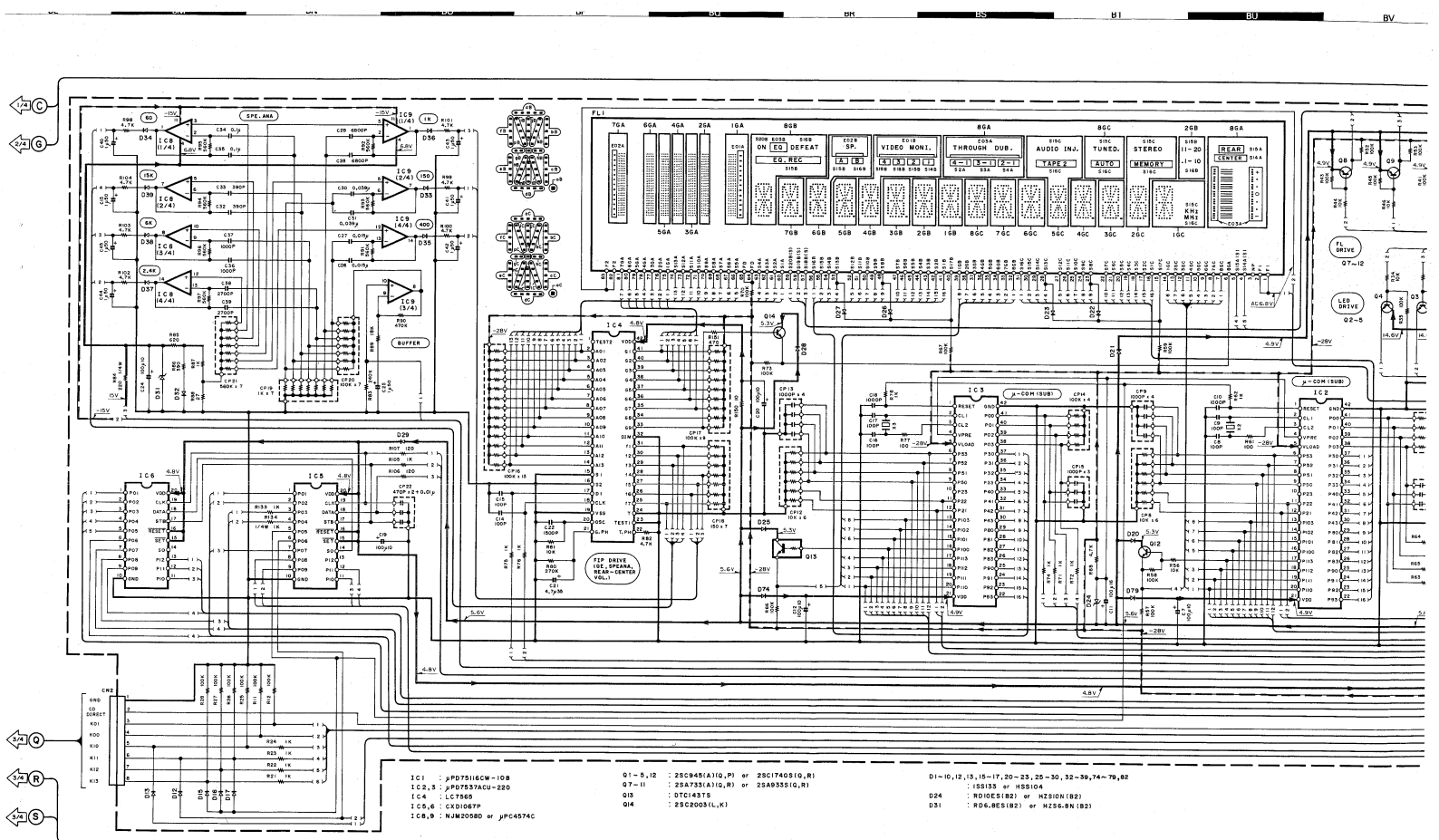


wurden mit einem
n. Dabei schwan-
den zwischen ein-
ngfügig.


BB
BC
BD
BE
BF
BG
BH
BI
BJ
BK
(X08-230X-XX)(B/7)
(X08-)(E/7)
PHONES
(X08-)(C/7)
SP:B
SP:A
Lch Rch
CN14
CN22
PHONES RELAY
BSP RELAY
ASP RELAY
RELAY DRIVE
MUTE
PROTECT SIGNAL
1st DIFFER AMP
FINAL (REAR)
IC16
IC51
RELAY DRIVE
FL ON/OFF
CE-CONT.
AVR
-30V
CN20
CN21
CN4
CN8
CN9
CN7
(X14-2700-10)(C/6)
BALANCE
VOLUME CONTROL
VOLUME MOTOR
MOTOR DRIVE
IC7
(X14-)(F/6)
(X14-2700-10)(D/6)
(Y)TYPE
(X08-)(C/7)
(X08-)(G/7)
(X08-)(B/7)
(X08-)(F/7)
(X08-)(F/7)(K)(P)TYPE
4P REG
AC IN
T.F 160℃
T.F 150℃
(K)TYPE
(P)TYPE
SIGNAL LINE
GND LINE
+B LINE
-B LINE
: μPC7805HF
: 2SD1302(S,T)
: 2SC945(A)(Q,P) or 2SC1740S(Q,R)
: 2SA733(A)(Q,P) or 2SA933S(Q,R)
: 2SB772(Q,P)
: 2SA992(E,F)
: 2SC1845(E,F)
: 2SC4157
: 2SD1893#5
: 2SB1253#5
9,60,62,65~71
: SS5668
: 1SS131 or HSS104A
: RD6.8ES(B2) or HZ6.8N(B2)
: RD18ES(B) or HZ18N(B)
: RD13ES(B2) or HZ13N(B2)
: RD5.1ES(B2) or HZ5.1N(B2)
: RBV-402LFA or D35BA20F03
: D5FB20※1
: HSS104 or 1SS133
IC7 : LB1641
Q6 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)
D60,61 : B30-0431-05
D62~67 : 1SS133 or HSS104
D68 : RD5.1ES(B2) or HZ5.1N(B2)
(X08-230X-XX)(B/7),(C/7)
CN22 CI21 RI71 J63 F1 F2 F3 F4 F5 F6 W18 ~18 W21 W24 ~30
K 0~10 NO 400V YES YES 6A NO J64 J65 J84 J85 YES YES NO
P 1~61 YES 400V YES NO 8A NO 5A 5A 2A 2A NO YES NO
Y 0~81 NO 250V NO YES 4A YES J66 J85 J84 J85 NO YES
Y05-2490-10(3/4)
KR-V9020
KENWOOD



IC1 : μPD75116CW-108
IC2,3 : μPD7537ACU-220
IC4 : LC7565
IC5,6 : CXD1067P
IC8,9 : NJM2058D or μPC4574C

Q1-5,12 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)
Q7-11 : 2SA733(A)(Q,R) or 2SA933S(Q,R)
Q13 : DTC143TS
Q14 : 2SC2003(L,K)

D1-10,12,13,15-17,20-23,25-30,32-39,74-79,82 : 1SS133 or HSS104
D24 : RD10ES(B2) or HZS10N(B2)
D31 : RD6.8ES(B2) or HZS6.8N(B2)

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

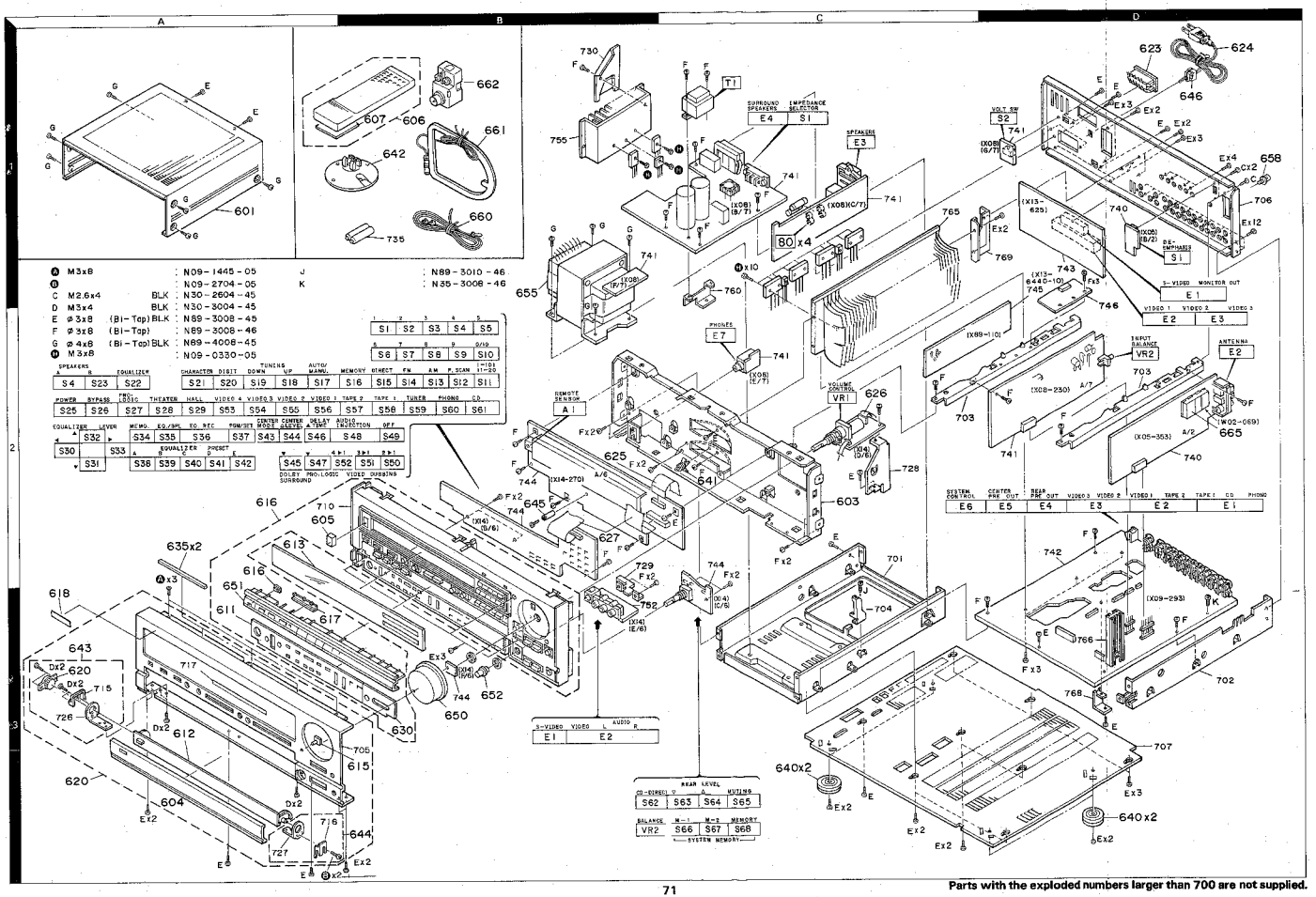
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig.

Y05-2490-10(4/4)

KR-V9020

KENWOOD

Y05-2490-10(4/4)



A	M3x8	: N09-1445-05	J		: N89-3010-46
B		: N09-2704-05	K		: N35-3008-46
C	M2.6x4	BLK : N30-2604-45			
D	M3x4	BLK : N30-3004-45			
E	Ø3x8	(Bi-Top) BLK : N89-3008-45			
F	Ø3x8	(Bi-Top) : N89-3008-46			
G	Ø4x8	(Bi-Top) BLK : N89-4008-45			
H	M3x8	: N09-0330-05			

Parts with the exploded numbers larger than 700 are not supplied.

PARTS LIST

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
			KR-V9020			
601	1A		A01-1806-01	METALLIC CABINET		
602	3A	*	A20-6027-01	PANEL ASSY		
603	2A,2B		A22-1093-02	SUB PANEL		
604	3A	*	A29-0167-02	PANEL		
605	2B		A33-0113-04	REFLECTOR		
606	1A,1B		A70-0342-05	REMOTE CONTROLLER ASSY		
607	1A,1B		A09-0086-08	BATTERY COVER		
610	2A,2B		B01-0436-02	PANEL ESCUTCHEON ASSY		
611	3A,3B		B03-2528-03	DRESSING PLATE		
612	3A		B07-1884-02	ESCUTCHEON		
613	2B,3B	*	B10-1086-03	FRONT GLASS		
615	3A		B12-0048-04	INDICATOR		
616	2A		B12-0123-04	INDICATOR		
617	2A,3A		B12-0124-04	INDICATOR		
618	2A,3A		B43-0287-04	KENWOOD BADGE		
-			B46-0092-03	WARRANTY CARD	K	
-			B46-0094-03	WARRANTY CARD	Y	
-			B46-0095-03	WARRANTY CARD	Y	
-			B46-0121-03	WARRANTY CARD	P	
-			B56-0513-04	CAUTION CARD (PRESET220-240)	Y	
-		*	B60-0100-00	INSTRUCTION MANUAL (ENGLISH)		
-		*	B60-0101-00	INSTRUCTION MANUAL (FRENCH)	P	
620	3B		D39-0200-05	DAMPER		
⚠623	1D		E03-0086-05	AC OUTLET		
⚠624	1D		E30-0812-05	AC POWER CORD	Y	
⚠624	1D		E30-2209-05	AC POWER CORD	KP	
625	2B,2C		E31-4457-05	WIRING HARNESS (X09-X14 CN3)		
626	2C,3D		E31-4990-05	WIRING HARNESS (X09-X14 CN7)		
627	2B		E31-7143-05	WIRING HARNESS (X14-X14 CN1)		
630	3B		F19-0597-04	BLIND PLATE		
635	3A		G11-0191-04	SOFT TAPE (90X5X2.5)		
-		*	H01-8798-04	ITEM CARTON CASE		
-			H10-3803-12	POLYSTYRENE FOAMED FIXTURE		
-			H10-3804-02	POLYSTYRENE FOAMED FIXTURE		
-			H11-0028-04	POLYSTYRENE FOAMED BOARD		
-			H12-2061-04	PACKING FIXTURE		
-			H13-0026-04	CARTON BOARD		
-			H25-0225-04	PROTECTION BAG (850X450X0.03)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
640	3C,3D		J02-1034-05	FOOT		
641	2B		J19-0506-05	UNIT HOLDER		
642	1B		J19-2815-04	ANTENNA HOLDER		
643	3A		J21-5495-04	DAMPER ASSY		
644	3A		J21-5539-04	MOUNTING HARDWARE ASSY		
645	2B	*	J39-0152-04	SPACER		
⚠646	1D		J42-0083-05	POWER CORD BUSHING		
-			J61-0307-05	WIRE BAND		
650	3B		K29-3633-04	KNOB ASSY (VOLUME CONTROL)		
651	3A,3B		K29-3636-02	KNOB (INPUT SELECTOR)		

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KR-V9020

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652	3B		K29-3642-04	KNOB (BALANCE)		
⚠655	1B,2B		L01-8621-05	POWER TRANSFORMER	K	
⚠655	1B,2B		L01-8625-05	POWER TRANSFORMER	Y	
⚠655	1B,2B		L01-8627-05	POWER TRANSFORMER	P	
658	1D		N08-0128-35	BINDING POST (EARTH)		
A	2A,3A		N09-1445-05	SET SCREW (M3X6)		
B	3A		N09-2704-05	TAPTITE SCREW		
C	1D		N30-2604-45	PAN HEAD MACHINE SCREW	Y	
D	3A		N30-3004-45	PAN HEAD MACHINE SCREW		
E	1A,1D		N89-3008-45	BINDING HEAD TAPTITE SCREW		
F	1C,2B		N89-3008-46	BINDING HEAD TAPTITE SCREW		
G	1A		N89-4008-45	BINDING HEAD TAPTITE SCREW		
660	1B		T90-0121-05	T TYPE ANTENNA		
661	1B		T90-0174-05	LOOP ANTENNA		
662	1B		T90-0177-05	ANTENNA ADAPTOR		
			TUNER UNIT (X05-3530-11: K, P, 0-82: Y)			
C1 ,2			CK45FF1H103Z	CERAMIC 0.010UF Z		
C3			CC93FCH1H391J	CERAMIC 390PF J		
C4			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C5			CE04LW1V100M	ELECTRO 10UF 35WV		
C6			CK45FF1H103Z	CERAMIC 0.010UF Z		
C7			CK45FF1H223Z	CERAMIC 0.022UF Z		
C8 ,9			CK45FF1H103Z	CERAMIC 0.010UF Z		
C10			CK45FF1H223Z	CERAMIC 0.022UF Z		
C11 ,12			CK45FF1H103Z	CERAMIC 0.010UF Z		
C13 -15			CE04LW1C470M	ELECTRO 47UF 16WV		
C16			CE04LW1H2R2M	ELECTRO 2.2UF 50WV		
C17			CE04LW1H3R3M	ELECTRO 3.3UF 50WV		
C18			CE04LW1V4R7M	ELECTRO 4.7UF 35WV		
C19			CF92FV1H223J	MF 0.022UF J		
C20			CF92FV1H273J	MF 0.027UF J		
C21			CK45FF1H223Z	CERAMIC 0.022UF Z		
C22			CC45FSL1H101J	CERAMIC 100PF J		
C23			CE04LW1HR47M	ELECTRO 0.47UF 50WV		
C24			CF92FV1H273J	MF 0.027UF J		
C25			CC45FCH1H220J	CERAMIC 22PF J		
C26			CK45FF1H103Z	CERAMIC 0.010UF Z		
C27			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C28			CC45FCH1H220J	CERAMIC 22PF J		
C29 -31			CC45FSL1H101J	CERAMIC 100PF J		
C32			CK45FF1H103Z	CERAMIC 0.010UF Z		
C35			CC93FCH1H471J	CERAMIC 470PF J		
C36 ,37			CF92FV1H273J	MF 0.027UF J	Y	
C36 ,37			CF92FV1H433J	MF 0.043UF J	KP	
C38 ,39			CF92FV1H153J	MF 0.015UF J	Y	
C40			CE04LW1H3R3M	ELECTRO 3.3UF 50WV		
C41 -43			CE04LW1H2R2M	ELECTRO 2.2UF 50WV		
C44			CK45FB1H471K	CERAMIC 470PF K		
C45			CF92FV1H473J	MF 0.047UF J		
C46			CE04LW1HR47M	ELECTRO 0.47UF 50WV		
C48			CE04LW1V100M	ELECTRO 10UF 35WV		
C49			CE04LW1C470M	ELECTRO 47UF 16WV		
C52 ,53			CC45FSL1H151J	CERAMIC 150PF J		

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TC1 ,2			C05-0303-05	CERAMIC TRIMMER CAPACITOR 20PF				
E2			E20-0321-05	LOCK TERMINAL BOARD (ANTENNA)				
CF1 ,2			L72-0531-05	CERAMIC FILTER				
CF3			L72-0099-05	CERAMIC FILTER				
CF4			L72-0096-05	CERAMIC FILTER				
L1			L40-1091-17	SMALL FIXED INDUCTOR				
L2			L40-1021-14	SMALL FIXED INDUCTOR(1.0MH,K)				
L3			L40-1091-17	SMALL FIXED INDUCTOR				
L4			L30-0484-05	FM IFT				
L5			L30-0485-05	FM IFT				
L8			L31-0509-05	MW-RF COIL				
L9			L32-0277-15	MW OSCILLATING COIL				
L10			L30-0362-05	AM IFT				
X1			L77-1122-05	CRYSTAL RESONATOR (7.2MHz)				
R14			RD14GB2E101J	FL-PROOF RD	100	J 1/4W		
R22 ,23			RD14GB2E101J	FL-PROOF RD	100	J 1/4W		
R24			RD14GB2E221J	FL-PROOF RD	220	J 1/4W		
R53			RD14GB2E330J	FL-PROOF RD	33	J 1/4W		
VR1			R12-3130-05	TRIMMING POT.33K				
VR2			R12-3126-05	TRIM POT.	10K			
VR3			R12-1089-05	TRIM POT.	4.7K			
VR4			R12-8015-05	TRIMMING POT.1M				
S1			S31-2072-05	SLIDE SWITCH (DE-EMPHASIS)			Y	
D1 ,2			1SS133	DIODE				
D1 ,2			1SS176	DIODE				
D3			HZS5.1N(B2)	ZENER DIODE				
D3			RD5.1ES(B2)	ZENER DIODE				
D4 -6			1SS133	DIODE				
D4 -6			1SS176	DIODE				
D7			KV1236(Z2)	VARIABLE CAPACITANCE DIODE				
IC1			LA1265	IC(FM/AM TUNER)				
IC2			LM7001	IC(PLL FREQUENCY SYNTHESIZER)				
IC3			AN7470	IC(FM MPX)				
Q1			2SC1923(R,O)	TRANSISTOR				
Q2			2SC1740S(Q,R)	TRANSISTOR				
Q2			2SC945(A)(Q,P)	TRANSISTOR				
Q3			2SC1845(F,E)	TRANSISTOR				
Q5 ,6			2SC1740S(Q,R)	TRANSISTOR			Y	
Q5 ,6			2SC945(A)(Q,P)	TRANSISTOR			Y	
Q7 ,8			2SA733(A)(Q,P)	TRANSISTOR				
Q7 ,8			2SA933S(Q,R)	TRANSISTOR				
665	2D		W02-0699-05	FM FRONT-END ASSY				
PRE-AMPLIFIER UNIT (X08-2300-10: K, 1-01: P, 0-82: Y)								
C1 ,2			CF92FV1H224J	MF	0.22UF	J		
C3			CF92FV1H682J	MF	6800PF	J		
C4			CE04GW1E4R7M	LL-ELEC	4.7UF	25WV		
C5			CE04LW1C470M	ELECTRO	47UF	16WV		
C6 ,7			CE04GW1E4R7M	LL-ELEC	4.7UF	25WV		
C8 ,9			CF92FV1H154J	MF	0.15UF	J		
C10 ,11			CF92FV1H104J	MF	0.10UF	J		
C12			CK45FB1H681K	CERAMIC	680PF	K		

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KR-V9020

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C13 -18			CE04LW1H010M	ELECTRO	1.0UF 50WV		
C19			CE04LW1C470M	ELECTRO	47UF 16WV		
C20 ,21			CC92FV1H224J	MF	0.22UF J		
C22			CE04GW1E4R7M	LL-ELEC	4.7UF 25WV		
C23			CE04LW1C221M	ELECTRO	220UF 16WV		
C24 ,25			CE04GW1E4R7M	LL-ELEC	4.7UF 25WV		
C26			CF92FV1H682J	MF	6800PF J		
C27 ,28			CF92FV1H334J	MF	0.33UF J		
C29			CK45FB1H681K	CERAMIC	680PF K		
C30 ,31			CF92FV1H104J	MF	0.10UF J		
C32			CF92FV1H474J	MF	0.47UF J		
C33			CE04LW1V100M	ELECTRO	10UF 35WV		
C34			CF92FV1H472J	MF	4700PF J		
C35			CF92FV1H333J	MF	0.033UF J		
C36			CE04LW1C470M	ELECTRO	47UF 16WV		
C37			CE04LW1C220M	ELECTRO	22UF 16WV		
C38			CE04LW1H010M	ELECTRO	1.0UF 50WV		
C39			CF92FV1H104J	MF	0.10UF J		
C40			CF92FV1H334J	MF	0.33UF J		
C41			CE04LW1C101M	ELECTRO	100UF 16WV		
C42			CF92FV1H273J	MF	0.027UF J		
C43			CF92FV1H682J	MF	6800PF J		
C44			CC45FSL1H180J	CERAMIC	18PF J		
C45			CE04LW1V4R7M	ELECTRO	4.7UF 35WV		
C46			CE04LW1H010M	ELECTRO	1.0UF 50WV		
C47			C90-1352-05	NP-ELEC	4.7UF 25WV		
C48			CC45FSL1H221J	CERAMIC	220PF J		
C49			CF92FV1H472J	MF	4700PF J		
C50			CF92FV1H682J	MF	6800PF J		
C51			CC45FSL1H100D	CERAMIC	10PF D		
C52 -54			CC45FSL1H101J	CERAMIC	100PF J		
C55 ,56			CE04LW1V100M	ELECTRO	10UF 35WV		
C57			CE04LW1HR22M	ELECTRO	0.22UF 50WV		
C58			CE04LW1C470M	ELECTRO	47UF 16WV		
C59 ,60			CE04LW1A101M	ELECTRO	100UF 10WV		
C61			CE04LW1H010M	ELECTRO	1.0UF 50WV		
C62			CE04LW1V100M	ELECTRO	10UF 35WV		
C63			CE04LW1H010M	ELECTRO	1.0UF 50WV		
C64			CC45FSL1H101J	CERAMIC	100PF J		
C65			CE04LW1H010M	ELECTRO	1.0UF 50WV		
C66			CE04LW1HR22M	ELECTRO	0.22UF 50WV		
C67			CE04LW1C470M	ELECTRO	47UF 16WV		
C68			CC93FCH1H152J	CERAMIC	1500PF J		
C69			CE04LW1V4R7M	ELECTRO	4.7UF 35WV		
C70 -72			CC45FSL1H101J	CERAMIC	100PF J		
C73			C90-1352-05	NP-ELEC	4.7UF 25WV		
C74			CE04LW1H010M	ELECTRO	1.0UF 50WV		
C75 -77			CC45FSL1H101J	CERAMIC	100PF J		
C78			CF92FV1H153J	MF	0.015UF J		
C79			CF92FV1H392J	MF	3900PF J		
C80 ,81			CK45FB1H821K	CERAMIC	820PF K		
C82			CF92FV1H392J	MF	3900PF J		
C83			CF92FV1H153J	MF	0.015UF J		
C84 ,85			CC45FSL1H101J	CERAMIC	100PF J		
C86 -88			CE04LW1H010M	ELECTRO	1.0UF 50WV		

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C89			CK45PF1H103Z	CERAMIC 0.010UF Z		
C90			CC45FSL1H101J	CERAMIC 100PF J		
C91 ,92			CK45FF1H103Z	CERAMIC 0.010UF Z		
C93			CC45FSL1H101J	CERAMIC 100PF J		
C94 ,95			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C115,116			CE04LW1H010M	ELECTRO 1.0UF 50WV		
⚠ C121			C91-0023-05	CERAMIC 0.01UF AC250V	Y	
⚠ C121			C91-0647-05	CERAMIC 0.01UF P	KP	
C126-129			CK45FF1H103Z	CERAMIC 0.010UF Z		
C131,132			CK45FF1H103Z	CERAMIC 0.010UF Z		
C142			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C143			CK45FF1H472Z	CERAMIC 4700PF Z		
C145			CC45FSL1H180J	CERAMIC 18PF J		
C146			CC45FSL1H820J	CERAMIC 82PF J		
C148			CE04LW1H470M	ELECTRO 47UF 50WV		
C149			CE04LW1C470M	ELECTRO 47UF 16WV		
C150			CE04LW1A101M	ELECTRO 100UF 10WV		
C151			CE04LW1H220M	ELECTRO 22UF 50WV		
C152			CF92EV1H473J	MP 0.047UF J		
C153			CK45FB1H222K	CERAMIC 2200PF K		
C154			CE04LW1E330M	ELECTRO 33UF 25WV		
C155		×	CE04LW2A100M	ELECTRO 10UF 100WV		
C156,157			C90-1745-05	ELECTRO 3300UF 42WV		
C158,159			C90-1318-05	ELECTRO 7500UF 80WV		
C160			C90-1745-05	ELECTRO 3300UF 42WV		
C161			CE04LW1V102M	ELECTRO 1000UF 35WV		
C162			CE04LW1E471M	ELECTRO 470UF 25WV		
C163			CE04LW1J470M	ELECTRO 47UF 63WV		
C164			CK45FF1H103Z	CERAMIC 0.010UF Z		
C165			CE04LW1A101M	ELECTRO 100UF 10WV		
C167		×	CE04LW2A010M	ELECTRO 1.0UF 100WV		
C168			CK45FB1H222K	CERAMIC 2200PF K		
C169			CE04LW1A221M	ELECTRO 220UF 10WV		
E3			E20-0823-05	LOCK TERMINAL BOARD(SP FRONT)		
E4			E20-0459-05	LOCK TERMINAL BOARD(SP REAR)		
E7			E11-0162-05	HEAD PHONE JACK (3P)		
⚠ F1			F05-8029-05	FUSE (UL) (250V 8A)	KP	
⚠ F1 ,2			F06-4029-05	FUSE (250V 4A)	Y	
⚠ F3 ,4			F04-5022-05	FUSE (UL) (125V 5A UL)	KP	
F5 ,6			F04-2025-05	FUSE (UL) (250V 2A)	P	
667	1C		J13-0041-05	FUSE CLIP	KP	
667	1C		J13-0054-05	FUSE CLIP		
L1			L40-2291-17	SMALL FIXED INDUCTOR		
L2			L39-0085-05	PHASE-COMPENSATION COIL		
T1			L01-8911-05	POWER TRANSFORMER	KP	
T1			L01-8914-05	POWER TRANSFORMER	Y	
X1			L76-0255-15	RESONATOR		
F	1B,1C		N89-3008-46	BINDING HEAD TAPTITE SCREW		
H	1B,1C		N09-0333-05	TAPPING SCREW (3X12)		
J	1C		N89-3010-46	BINDING HEAD TAPTITE SCREW		
CP1			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R10			RD14GB2E101J	EL-PROOF RD 100 J 1/4W		
R171			R92-0173-05	RC 2.2M M 1/2W	KP	

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R183			RD14NB2E101J	RD 100 J 1/4W		
R185,186			RD14GB2E101J	FL-PROOF RD 100 J 1/4W		
R190,191			RS14KB3A4R7J	FL-PROOF RS 4.7 J 1W		
R196			RS14KB3A472J	FL-PROOF RS 4.7K J 1W		
R197			RD14NB2E101J	RD 100 J 1/4W		
R202			RD14NB2E101J	RD 100 J 1/4W		
R209			RD14NB2E101J	RD 100 J 1/4W		
R211			RD14NB2E101J	RD 100 J 1/4W		
R213			RD14NB2E101J	RD 100 J 1/4W		
R214,215			RS14KB3A561J	FL-PROOF RS 560 J 1W		
VR1			R12-5059-05	TRIMMING POT.(100K)		
⚠K1			S51-1036-05	MAGNETIC RELAY		
K2 -5			S51-2078-05	MAGNETIC RELAY		
S1			S31-2136-05	SLIDE SWITCH(IMPEDANCE SELECT)		
⚠S2			S31-3010-05	SLIDE SWITCH(VOLTAGE SELECT)	Y	
D1			HSS104	DIODE		
D1			1SS133	DIODE		
D41 -49			S5566B	DIODE		
D50 ,51			HSS104A	DIODE		
D50 ,51			1SS131	DIODE		
D52			S5566B	DIODE		
D53			HSS104A	DIODE		
D53			1SS131	DIODE		
D54			HZS6.8N(B2)	ZENER DIODE		
D54			RD6.8ES(B2)	ZENER DIODE		
D55 ,56			HZS18N(B)	ZENER DIODE		
D55 ,56			RD18ES(B)	ZENER DIODE		
D57			HZS13N(B2)	ZENER DIODE		
D57			RD13ES(B2)	ZENER DIODE		
D58			HSS104A	DIODE		
D58			1SS131	DIODE		
D59 ,60			S5566B	DIODE		
D61			HZS5.1N(B2)	ZENER DIODE		
D61			RD5.1ES(B2)	ZENER DIODE		
D62			S5566B	DIODE		
D63			D3SBA20F03	DIODE		
D63			RBV-402LFA	DIODE		
D64			D5FB20*1	DIODE		
D65 -71			S5566B	DIODE		
D72 ,73			HSS104	DIODE		
D72 ,73			1SS133	DIODE		
IC1			NJM2058D	IC(OP AMP X4)		
IC2			TC4011BP	IC(NAND X4)		
IC3			NJM2058D	IC(OP AMP X4)		
IC4			TC9162N	IC(ANALOG SWITCH ARRAY)		
IC5			NJM4565L	IC		
IC6			UPC1571C	IC(NOISE SUPPRESSOR)		
IC7			NJM78L05A	IC(VOLTAGE REGULATOR/ +5V)		
IC8			YM3428	IC		
IC9			LA2730	IC(DOLBY SYSTEM)		
IC10			NJM072BL	IC(OP AMP)		
IC11			NJM4565L	IC		
IC12			LA2770	IC		
IC16			UPC7805HF	IC(VOLTAGE REGULATOR/ +5V)		

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IC17			UPC78L12J	IC(VOLTAGE REGULATOR/ +12V)			
Q1			2SC1740S(Q,R)	TRANSISTOR			
Q1			2SC945(A)(Q,P)	TRANSISTOR			
Q2 ,3			2SC2878(B)	TRANSISTOR			
Q5			2SA733(A)(Q,P)	TRANSISTOR			
Q5			2SA933S(Q,R)	TRANSISTOR			
Q21			2SD1302(S,T)	TRANSISTOR			
Q22			2SC1740S(Q,R)	TRANSISTOR			
Q22			2SC945(A)(Q,P)	TRANSISTOR			
Q23			2SA733(A)(Q,P)	TRANSISTOR			
Q23			2SA933S(Q,R)	TRANSISTOR			
Q24			2SB772(Q,P)	TRANSISTOR			
Q25 -27			2SA992(P,E)	TRANSISTOR			
Q28			2SC1845(P,E)	TRANSISTOR			
Q29			2SC4137	TRANSISTOR			
Q30			2SD1893*5	TRANSISTOR			
Q31			2SB1253*5	TRANSISTOR			
Q32			2SC1845(P,E)	TRANSISTOR			
Q33			2SA733(A)(Q,P)	TRANSISTOR			
Q33			2SA933S(Q,R)	TRANSISTOR			
Q34 -37			2SC1740S(Q,R)	TRANSISTOR			
Q34 -37			2SC945(A)(Q,P)	TRANSISTOR			
AUDIO UNIT (X09-2930-10: K, Y, 1-01: P)							
C3 ,4			CE04LW1V100M	ELECTRO	10UF	35WV	
C5 ,6			CC45FSL1H221J	CERAMIC	220PF	J	
C9 ,10			CE04LW1A101M	ELECTRO	100UF	10WV	
C11 ,12			CF92FV1H123J	MF	0.012UF	J	
C13 ,14			CF92FV1H332J	MF	3300PF	J	
C15 ,16			CE04LW1V4R7M	ELECTRO	4.7UF	35WV	
C17 -38			CK45FB1H471K	CERAMIC	470PF	K	
C39 ,40			CE04LW1HR47M	ELECTRO	0.47UF	50WV	
C43 ,44			CE04LW1V100M	ELECTRO	10UF	35WV	
C45 ,46			CE04LW1HR47M	ELECTRO	0.47UF	50WV	
C49 ,50			CE04LW1V4R7M	ELECTRO	4.7UF	35WV	
C51 ,52			CE04LW1HR47M	ELECTRO	0.47UF	50WV	
C55 ,56			CE04LW1V4R7M	ELECTRO	4.7UF	35WV	
C57 ,58			CF92FV1H104J	MF	0.10UF	J	
C59 ,60			CC45FSL1H220J	CERAMIC	22PF	J	
C61 ,62			CE04LW1H010M	ELECTRO	1.0UF	50WV	
C63 ,64			CF92FV1H104J	MF	0.10UF	J	
C65 ,66			CK45FB1H471K	CERAMIC	470PF	K	
C71 ,72			CE04LW1H010M	ELECTRO	1.0UF	50WV	
C73 ,74			CK45FB1H471K	CERAMIC	470PF	K	
C75 ,76			CE04LW1H010M	ELECTRO	1.0UF	50WV	
C77 ,78			CE04LW1H2R2M	ELECTRO	2.2UF	50WV	
C79 ,80			CF92FV1H124J	MF	0.12UF	J	
C81 ,82			CE04LW1H010M	ELECTRO	1.0UF	50WV	
C83 ,84			C91-0692-05	CERAMIC	0.047UF	K	
C85 ,86			CE04LW1HR33M	ELECTRO	0.33UF	50WV	
C87 ,88			C91-0682-05	CERAMIC	0.018UF	K	
C89 ,90			CF92FV1H124J	MF	0.12UF	J	
C91 ,92			C91-0674-05	CERAMIC	0.0082UF	K	
C93 ,94			C91-0694-05	CERAMIC	0.056UF	K	
C95 ,96			C91-0662-05	CERAMIC	0.0027UF	K	

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C97 ,98			C91-0682-05	CERAMIC 0.018UF K		
C99 ,100			C91-0656-05	CERAMIC 0.0015UF K		
C101,102			C91-0674-05	CERAMIC 0.0082UF K		
C103,104			CK45FB1H471K	CERAMIC 470PF K		
C111,112			CE04LW1HR47M	ELECTRO 0.47UF 50WV		
C115,116			CC45FSL1H101J	CERAMIC 100PF J		
C117,118			CE04LW1V4R7M	ELECTRO 4.7UF 35WV		
C119,120			CE04LW1HR47M	ELECTRO 0.47UF 50WV		
C123,124			CE04LW1V4R7M	ELECTRO 4.7UF 35WV		
C125,126			CE04LW1HR47M	ELECTRO 0.47UF 50WV		
C129,130			CE04LW1V4R7M	ELECTRO 4.7UF 35WV		
C131,132			CK45FB1H471K	CERAMIC 470PF K		
C134			CE04LW1V100M	ELECTRO 10UF 35WV		
C151			CE04LW1E101M	ELECTRO 100UF 25WV		
C152			CE04LW1E470M	ELECTRO 47UF 25WV		
C153			CE04LW1C470M	ELECTRO 47UF 16WV		
C155			CK45FB1H102K	CERAMIC 1000PF K		
C156,157			CE04LW1C470M	ELECTRO 47UF 16WV		
C158,159			CE04LW1C101M	ELECTRO 100UF 16WV		
C160			CE04LW1V4R7M	ELECTRO 4.7UF 35WV		
C161			CE04LW1C470M	ELECTRO 47UF 16WV		
C162			CE04LW1V100M	ELECTRO 10UF 35WV		
C163			C90-1456-05	NP-ELEC 0.22UF 50WV		
C164			CE04LW1C470M	ELECTRO 47UF 16WV		
C165			CK45FB1H471K	CERAMIC 470PF K		
C166			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C167-169			CK45FF1H472Z	CERAMIC 4700PF Z		
C170,171			CK45FB1H102K	CERAMIC 1000PF K		
C172			C90-1455-05	NP-ELEC 0.1UF 50WV		
C173-175			CE04LW1V100M	ELECTRO 10UF 35WV		
C176			CK45FF1H103Z	CERAMIC 0.010UF Z		
C177			CK45FB1H471K	CERAMIC 470PF K		
C178			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C179			CE04LW1H2R2M	ELECTRO 2.2UF 50WV		
C182			CK45FF1H472Z	CERAMIC 4700PF Z		
C183			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C184			CK45FB1H471K	CERAMIC 470PF K		
C186			CE04LW1V10OM	ELECTRO 10UF 35WV		
C187,188			CC45FSL1H221J	CERAMIC 220PF J		
C189-192			CE04LW1V100M	ELECTRO 10UF 35WV		
C195-197			CE04LW1H2R2M	ELECTRO 2.2UF 50WV		
C198			CK45FB1H102K	CERAMIC 1000PF K		
C201			CE04LW1H010M	ELECTRO 1.0UF 50WV		
CN10			E10-0408-05	FLAT CABLE CONNECTOR		
E1			E13-0634-05	PHONO JACK (6P)(PHONO,CD,TAPE)		
E2 ,3			E13-0820-05	PHONO JACK (8P)(TAPE,VIDEO)		
E4			E13-0235-05	PHONO JACK (2P)(REAR OUT)		
E5			E13-0138-05	PHONO JACK (1P)(CENTOR OUT)		
E6			E11-0188-05	PHONE JACK (SYSTEM CONTROL)		
L1 ,2			L39-0085-05	PHASE-COMPENSATION COIL		
E	3D		N89-3008-45	BINDING HEAD TAPTITE SCREW		
F	2D,3D		N89-3008-46	BINDING HEAD TAPTITE SCREW		
H	1C		N09-0333-05	TAPPING SCREW (3X12)		

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K	1C		N35-3008-46	BINDING HEAD MACHINE SCREW		
CP1 ,2			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R91 ,92			RS14KB3D4R7J	FL-PROOF RS 4.7 J 2W		
R93 ,94			RS14KB3A4R7J	FL-PROOF RS 4.7 J 1W		
R182,183			RD14AB2E120J	FL-PROOF RD 12 J 1/4W		
R231,232			RD14AB2E391J	FL-PROOF RD 390 J 1/4W		
R243,244			RD14AB2E391J	FL-PROOF RD 390 J 1/4W		
R252			RS14KB3D680J	FL-PROOF RS 68 J 2W		
D51			HZS15N(B1)	ZENER DIODE		
D51			HZS15N(B2)	ZENER DIODE		
D51			RD15ES(B1)	ZENER DIODE		
D51			RD15ES(B2)	ZENER DIODE		
D52			HZS5.1N(B2)	ZENER DIODE		
D52			RD5.1ES(B2)	ZENER DIODE		
D53 ,54			HZS6.8N(B2)	ZENER DIODE		
D53 ,54			RD6.8ES(B2)	ZENER DIODE		
D55			HZS13N(B2)	ZENER DIODE		
D55			RD13ES(B2)	ZENER DIODE		
D56 -69			HSS104	DIODE		
D56 -69			1SS133	DIODE		
D71 ,72			HSS104	DIODE		
D71 ,72			1SS133	DIODE		
D73			HSS104A	DIODE		
D73			1SS131	DIODE		
D78			HSS104A	DIODE		
D78			1SS131	DIODE		
D83			HZS5.1N(B2)	ZENER DIODE		
D83			RD5.1ES(B2)	ZENER DIODE		
D84 ,85			HZS4.7N(B)	ZENER DIODE		
D84 ,85			RD4.7ES(B)	ZENER DIODE		
D86 ,87			HSS104	DIODE		
D86 ,87			1SS133	DIODE		
IC1			UPC4570C-A	IC		
IC2			TC9164N	IC(16CH BILATERAL SELECTOR SW)		
IC3 ,4			TC9163N	IC(BILATERAL SWITCH X16)		
IC5			NJM4558D	IC(OP AMP X2)		
IC6 ,7			UPC4570C-A	IC		
IC8 ,9			NJM4558D	IC(OP AMP X2)		
IC10			TC9176P	IC(2CH ELECTRONIC VOLUME)		
IC11			NJM4558D	IC(OP AMP X2)		
IC12			LC7522	IC(7CH GRAPHIC EQUALIZER)		
IC13,14			M5229P	IC(7CH GRAPHIC EQUALIZER)		
IC15			LC4966	IC(CMOS LOGIC BILATERAL SW)		
IC16			NJM4558D	IC(OP AMP X2)		
Q1 ,2			2SC2922*5	TRANSISTOR		
Q3 ,4			2SA1216*5	TRANSISTOR		
Q5 ,6			2SC4137	TRANSISTOR		
Q7 -14			2SC2878(B)	TRANSISTOR		
Q21			2SD1266	TRANSISTOR		
Q22			2SC1740S(Q,R)	TRANSISTOR		
Q22			2SC945(A)(Q,P)	TRANSISTOR		
Q23 ,24			2SD1266	TRANSISTOR		
Q25			2SA733(A)(Q,P)	TRANSISTOR		

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Q25			2SA933S(Q,R)	TRANSISTOR		
Q26			2SC1740S(Q,R)	TRANSISTOR		
Q26			2SC945(A)(Q,P)	TRANSISTOR		
Q27			2SA733(A)(Q,P)	TRANSISTOR		
Q27			2SA933S(Q,R)	TRANSISTOR		
Q28			2SD1266	TRANSISTOR		
Q29			2SC2003(L,K)	TRANSISTOR		
Q30			2SA733(A)(Q,P)	TRANSISTOR		
Q30			2SA933S(Q,R)	TRANSISTOR		
Q32			2SA733(A)(Q,P)	TRANSISTOR		
Q32			2SA933S(Q,R)	TRANSISTOR		
Q34 ,35			2SC1740S(Q,R)	TRANSISTOR		
Q34 ,35			2SC945(A)(Q,P)	TRANSISTOR		
Q36 -38			2SA733(A)(Q,P)	TRANSISTOR		
Q36 -38			2SA933S(Q,R)	TRANSISTOR		
ACCESSORY UNIT (X13-6250-10)						
C1 ,2			CE04LW1C470M	ELECTRO 47UF 16WV		
C3 ,4			CE04LW1A221M	ELECTRO 220UF 10WV		
C5 ,6			CE04LW1A101M	ELECTRO 100UF 10WV		
C7			CK45FF1H103Z	CERAMIC 0.010UF Z		
C8 -15			CE04LW1A101M	ELECTRO 100UF 10WV		
C16			CE04LW1H3R3M	ELECTRO 3.3UF 50WV		
C17 -19			CC45FSL1H101J	CERAMIC 100PF J		
C20			CC45FCH1H270J	CERAMIC 27PF J		
C21 ,22			CC45FCH1H220J	CERAMIC 22PF J		
C23			CC45FCH1H270J	CERAMIC 27PF J		
C24 ,25			CE04LW1H010M	ELECTRO 1.0UF 50WV		
C26 -28			CE04LW1A101M	ELECTRO 100UF 10WV		
C29			CF92FV1H104J	MF 0.10UF J		
C30			CF92FV1H102J	MF 1000PF J		
C31			CF92FV1H242J	MF 2400PF J		
C32			CF92FV1H102J	MF 1000PF J		
C33			CE04LW1H2R2M	ELECTRO 2.2UF 50WV		
C34			CE04LW1V100M	ELECTRO 10UF 35WV		
C35			CE04LW1H2R2M	ELECTRO 2.2UF 50WV		
C36			CE04LW1H0R1M	ELECTRO 0.1UF 50WV		
E1			E06-0407-05	CYLINDRICAL RECEPTACLE(SVIDEO)		
E2 ,3			E13-0318-05	PHONO JACK(3P)(VIDEO,MONI OUT)		
L1			L40-1501-17	SMALL FIXED INDUCTOR(15UH,K)		
X1			L77-1131-05	CRYSTAL RESONATOR (7.159MHz)		
R1 ,2			RS14KB3D121J	FL-PROOF RS 120 J 2W		
R3 ,4			RS14KB3D180J	FL-PROOF RS 18 J 2W		
R45			RD14GB2E100J	FL-PROOF RD 10 J 1/4W		
R82 ,83			RS14KB3D151J	FL-PROOF RS 150 J 2W		
D1 ,2			HZS5.6N(B2)	ZENER DIODE		
D1 ,2			RD5.6ES(B2)	ZENER DIODE		
D3 -29			HSS104	DIODE		
D3 -29			1SS133	DIODE		
IC1			UPA80C	IC(7CH TRANSISTOR ARRAY)		
IC2 -4			UPD4066BC	IC(BILATERAL SWITCH X4)		
IC5			MB88323A-K2	IC(DISPLAY CONTROLLER)		
IC6			UPD4069UBC	IC(INVERTER X6)		
IC7 -11			MC14577A	IC		
Q1			2SD882(Q,P)	TRANSISTOR		

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Q2			2SB772(Q,P)	TRANSISTOR				
Q3			2SC1740S(Q,R)	TRANSISTOR				
Q3			2SC945(A)(Q,P)	TRANSISTOR				
Q4			2SA733(A)(Q,P)	TRANSISTOR				
Q4			2SA933S(Q,R)	TRANSISTOR				
Q5 -7			2SC1740S(Q,R)	TRANSISTOR				
Q5 -7			2SC945(A)(Q,P)	TRANSISTOR				
Q8			2SD882(Q,P)	TRANSISTOR				
Q9			2SB772(Q,P)	TRANSISTOR				
Q10 ,11			2SC2878(A,B)	TRANSISTOR				
DOLBY AUTO BIAS UNIT (X13-6440-10)								
C1 ,2			CE04LW1V100M	ELECTRO	10UF	35WV		
C3			CC45FSL1H101J	CERAMIC	100PF	J		
C4			CE04GW1E100M	LL-ELEC	10UF	25WV		
C5 ,6			CE04LW1C101M	ELECTRO	100UF	16WV		
VR1 ,2			R12-3126-05	TRIM POT.	10K			
D1 -4			HSS104	DIODE				
D1 -4			1SS133	DIODE				
IC1			TDA1074A	IC(18-LEAD PUAL IN-LINE)				
IC2 ,3			NJM072BD	IC(FET OP AMP X2)				
Q1			2SC1740S(Q,R)	TRANSISTOR				
Q1			2SC945(A)(Q,P)	TRANSISTOR				
Q2			2SK163(L,M)	FET				
DISPLAY UNIT (X14-2700-10)								
D56 -59			B30-1012-05	LED(SLP-981C-50)				
D60 ,61			B30-0431-05	LED(LN21CPH)				
C1		*	C90-1826-05	BACKUP	0.047F	5.5WV		
C2			CE04LW1A101M	ELECTRO	100UF	10WV		
C3			CE04LW1H010M	ELECTRO	1.0UF	50WV		
C4 ,5			CC45FSL1H101J	CERAMIC	100PF	J		
C6			CE04LW1C101M	ELECTRO	100UF	16WV		
C7			CE04LW1A101M	ELECTRO	100UF	10WV		
C8 ,9			CC45FSL1H101J	CERAMIC	100PF	J		
C10			CK45FB1H102K	CERAMIC	1000PF	K		
C11			CE04LW1C101M	ELECTRO	100UF	16WV		
C12			CE04LW1A101M	ELECTRO	100UF	10WV		
C13			CE04LW1H010M	ELECTRO	1.0UF	50WV		
C14 -17			CC45FSL1H101J	CERAMIC	100PF	J		
C18			CK45FB1H102K	CERAMIC	1000PF	K		
C19 ,20			CE04LW1A101M	ELECTRO	100UF	10WV		
C21			CE04LW1V4R7M	ELECTRO	4.7UF	35WV		
C22			CK45FB1H152K	CERAMIC	1500PF	K		
C23 ,24			CE04LW1A101M	ELECTRO	100UF	10WV		
C25			CE04LW1H010M	ELECTRO	1.0UF	50WV		
C26 ,27			C91-0680-05	CERAMIC	0.015UF	K		
C28 ,29			C91-0672-05	CERAMIC	0.0068UF	K		
C30 ,31			C91-0690-05	CERAMIC	0.039UF	K		
C32 ,33			CK45FB1H391K	CERAMIC	390PF	K		
C34 ,35			C91-0700-05	CERAMIC	0.1UF	J		
C36 ,37			C91-0652-05	CERAMIC	0.001UF	K		
C38 ,39			C91-0662-05	CERAMIC	0.0027UF	K		
C40 -45			CE04LW1H010M	ELECTRO	1.0UF	50WV		
C46			CK45FF1H223Z	CERAMIC	0.022UF	Z		

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C47 ,48			CF92FV1H104J	MF	0.10UF	J		
C49			C90-1333-05	NP-ELEC	22UF	10WV		
C50 ,51			CK45FB1H102K	CERAMIC	1000PF	K		
C52			CE04LW1C101M	ELECTRO	100UF	16WV		
C53 ,54			CK45FF1H223Z	CERAMIC	0.022UF	Z		
C55 ,56			CE04LW1H010M	ELECTRO	1.0UF	50WV		
C57 ,58			CK45FF1H103Z	CERAMIC	0.010UF	Z		
CN8			E10-0509-05	FLAT CABLE CONNECTOR				
E1			E06-0821-05	CYLINDRICAL RECEPTACLE (VIDEO)				
E2			E13-0311-05	PHONO JACK		(AUDIO)		
X1			L78-0209-05	RESONATOR	(4.194MHZ)			
X2 ,3			L78-0239-05	RESONATOR				
CP1			R90-0844-05	MULTI-COMP	1000PX2			
CP2			R90-0849-05	MULTI-COMP	1KX5	J 1/6W		
CP3			R90-0841-05	MULTI-COMP	510KX8	J 1/6W		
CP4			R90-0483-05	MULTI-COMP	100KX13	J 1/6W		
CP5			R90-0837-05	COMPOSITE ELEMENTS				
CP6			R90-0802-05	MULTI-COMP	100KX10	J 1/4W		
CP7			R90-0845-05	MULTI-COMP	1000PX2	+0 .01		
CP8			R90-0810-05	MULTIPLE RESISTOR				
CP9			R90-0842-05	MULTI-COMP	1000PX4			
CP10			R90-0462-05	MULTI-COMP	100KX4	J 1/6W		
CP11			R90-0843-05	MULTI-COMP	1000PX3			
CP12			R90-0810-05	MULTIPLE RESISTOR				
CP13			R90-0842-05	MULTI-COMP	1000PX4			
CP14			R90-0482-05	MULTI-COMP	100KX4	J 1/6W		
CP15			R90-0843-05	MULTI-COMP	1000PX3			
CP16			R90-0483-05	MULTI-COMP	100KX13	J 1/6W		
CP17			R90-0493-05	MULTI-COMP	100KX9	J 1/6W		
CP18			R90-0846-05	MULTI-COMP	150X7	J 1/6W		
CP19			R90-0847-05	MULTI-COMP	1KX7	J 1/6W		
CP20			R90-0276-05	MULTI-COMP	100KX7	J 1/6W		
CP21			R90-0848-05	MULTI-COMP	560KX7	J 1/6W		
CP22			R90-0838-05	COMPOSITE ELEMENTS				
CP23			R90-0492-05	MULTI-COMP	100KX8	J 1/6W		
R84			RD14AB2E221J	FL-PROOF RD	220	J 1/4W		
R118			RD14AB2E100J	FL-PROOF RD	10	J 1/4W		
R124			RD14AB2E3R9J	FL-PROOF RD	3.9	J 1/4W		
VR1			R29-5027-05	POTENTIOMETER (VOLUME CONTROL)				
VR2			R10-5032-05	POTENTIOMETER (BALANCE)				
S1 -68			S40-1064-05	PUSH SWITCH				
D1 -10			HSS104	DIODE				
D1 -10			1SS133	DIODE				
D12 ,13			HSS104	DIODE				
D12 ,13			1SS133	DIODE				
D15 -17			HSS104	DIODE				
D15 -17			1SS133	DIODE				
D20 -23			HSS104	DIODE				
D20 -23			1SS133	DIODE				
D24			HZS10N(B2)	ZENER DIODE				
D24			RD10ES(B2)	ZENER DIODE				
D25 -30			HSS104	DIODE				

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D25 -30			1SS133	DIODE				
D31			HZS6.8N(B2)	ZENER DIODE				
D31			RD6.8ES(B2)	ZENER DIODE				
D32 -55			HSS104	DIODE				
D32 -55			1SS133	DIODE				
D62 -67			HSS104	DIODE				
D62 -67			1SS133	DIODE				
D68			HZS5.1N(B2)	ZENER DIODE				
D68			RD5.1ES(B2)	ZENER DIODE				
D69 ,70			HSS104	DIODE				
D69 ,70			1SS133	DIODE				
D74 -79			HSS104	DIODE				
D74 -79			1SS133	DIODE				
D82			HSS104	DIODE				
D82			1SS133	DIODE				
FL1			BG-652GK	FLUORESCENT INDICATOR TUBE				
IC1			UPD75116CW-108	IC(MICROPROCESSOR)				
IC2 ,3			UPD7537ACU-220	IC(MICROPROCESSOR)				
IC4			LC7565	IC(GRAPHIC EQ FL DISPLAY DR)				
IC5 ,6			CXD1067P	IC(SERIAL-PARALLEL CONVERTER)				
IC7			LB1641	IC(MOTOR DRIVER)				
IC8 ,9			NJM2058D	IC(OP AMP X4)				
IC8 ,9			UPC4574C	IC(OP AMP X4)				
Q1 -6			2SC1740S(Q,R)	TRANSISTOR				
Q1 -6			2SC945(A)(Q,P)	TRANSISTOR				
Q7			2SA733(A)(Q,P)	TRANSISTOR				
Q7			2SA933S(Q,R)	TRANSISTOR				
Q8			2SA733(A)(Q,P)	TRANSISTOR				
Q8			2SA933S(Q,R)	TRANSISTOR				
Q9			2SA733(A)(Q,P)	TRANSISTOR				
Q9			2SA933S(Q,R)	TRANSISTOR				
Q10			2SA733(A)(Q,P)	TRANSISTOR				
Q10			2SA933S(Q,R)	TRANSISTOR				
Q11			2SA733(A)(Q,P)	TRANSISTOR				
Q11			2SA933S(Q,R)	TRANSISTOR				
Q12			2SC1740S(Q,R)	TRANSISTOR				
Q12			2SC945(A)(Q,P)	TRANSISTOR				
Q13			DTC143TS	DIGITAL TRANSISTOR				
Q14			2SC2003(L,K)	TRANSISTOR				
A1			W02-0975-05	ELECTRIC CIRCUIT MODULE				
MAIN AMPLIFIER UNIT (X89-1100-10 : K,Y, 1-01 : P)								
C1 ,2			CE04LW1H010M	ELECTRO	1.0UF	50WV		
C5 ,6			CE04LW1C101M	ELECTRO	100UF	16WV		
C7 ,8			CF92FV1H133	MF	0.011UF	J		
C9 ,10			CC45FSL1H470J	CERAMIC	47PF	J		
C11 ,12			CC45FSL1H100D	CERAMIC	10PF	D		
C13 ,14			CC45FSL1H470J	CERAMIC	47PF	J		
C15 ,16			CC45FSL1H221J	CERAMIC	220PF	J		
C17 ,18			CE04LW2A470M	ELECTRO	47UF	100WV		
C19 -22			CK45FF1H103Z	CERAMIC	0.010UF	Z		
C23			C90-1333-05	NP-ELEC	22UF	10WV		
C24			CE04LW1C220M	ELECTRO	22UF	16WV		
C26			CE04LW1H010M	ELECTRO	1.0UF	50WV		
C29 ,30			CE04LW1C220M	ELECTRO	22UF	16WV		

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R19			RD14GB2E122J	FL-PROOF RD 1.2K J 1/4W	KY	
R19 -22			RD14GB2E122J	FL-PROOF RD 1.2K J 1/4W	P	
R20 -22			RD14AB2E122J	FL-PROOF RD 1.2K J 1/4W	KY	
R23			RD14GB2E181J	FL-PROOF RD 180 J 1/4W	KY	
R23 ,24			RD14GB2E181J	FL-PROOF RD 180 J 1/4W	P	
R24			RD14AB2E181J	FL-PROOF RD 180 J 1/4W	KY	
R29 -32			RD14AB2E221J	FL-PROOF RD 220 J 1/4W	KY	
R29 -32			RD14GB2E221J	FL-PROOF RD 220 J 1/4W	P	
R39 -42			RD14AB2E220J	FL-PROOF RD 22 J 1/4W	KY	
R39 -42			RD14GB2E220J	FL-PROOF RD 22 J 1/4W	P	
R43 -46			RD14AB2E221J	FL-PROOF RD 220 J 1/4W	KY	
R43 -46			RD14GB2E221J	FL-PROOF RD 220 J 1/4W	P	
R47 -50			RD14AB2E2R2J	FL-PROOF RD 2.2 J 1/4W	KY	
R47 -50			RD14GB2E2R2J	FL-PROOF RD 2.2 J 1/4W	P	
R51			RD14GB2E220J	FL-PROOF RD 22 J 1/4W		
R52			RD14GB2E100J	FL-PROOF RD 10 J 1/4W		
R61			RD14AB2E101J	FL-PROOF RD 100 J 1/4W	KY	
R61			RD14GB2E101J	FL-PROOF RD 100 J 1/4W	P	
R64			RD14AB2E101J	FL-PROOF RD 100 J 1/4W	KY	
R64			RD14GB2E101J	FL-PROOF RD 100 J 1/4W	P	
VR1 ,2			R12-1070-05	TRIM POT. 1K		
D1 ,2			HZS5.1N(B2)	ZENER DIODE		
D1 ,2			RD5.1ES(B2)	ZENER DIODE		
D3 ,4			HSS104	DIODE		
D3 ,4			1SS133	DIODE		
D5 -8			HSS104A	DIODE		
D5 -8			1SS131	DIODE		
D9 ,10			HSS104A	DIODE		
D9 ,10			1SS131	DIODE		
IC1			UPC1237HA	IC(POWER AMP)		
Q1 -4			2SC1845(F,E)	TRANSISTOR		
Q5 -8			2SC1740S(Q,R)	TRANSISTOR		
Q5 -8			2SC945(A)(Q,P)	TRANSISTOR		
Q9 -12			2SC1845(F,E)	TRANSISTOR		
Q13 -18			2SA1123(R,S)	TRANSISTOR		
Q19 ,20			2SC2631(R,S)	TRANSISTOR		
Q21 ,22			2SC3944(Q,R)	TRANSISTOR		
Q23 ,24			2SA1535(Q,R)	TRANSISTOR		
Q25 ,26			2SC2631(R,S)	TRANSISTOR		
Q27 -29			2SA992(F,B)	TRANSISTOR		

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KR-V9020

SPECIFICATIONS

AUDIO SECTION

Rated Power Output
(Front)

130 watts per channel minimum RMS, both channels driven at 8 ohms, from 20 Hz to 20,000 Hz with no more than 0.008% total harmonic distortion. (FTC)

(Rear)
20 watts per channel minimum RMS, both channel driven at 8 ohms at 1 kHz with no more than 0.9% total harmonic distortion.

Total Harmonic Distortion
(1 kHz, 8 ohms) 0.003%
Input Sensitivity/Impedance
PHONO (MM) ..... 2.5 mV/47 kohms
CD, TAPE ..... 200 mV/47 kohms
VIDEO 250 mV/47kohms
Frequency Response
CD, TAPE, VIDEO ..... 10 Hz – 100 kHz $^{+0}_{-3}$ dB

Signal-to-Noise Ratio (IHF-A)
PHONO (MM) ..... 79 dB
CD, TAPE ..... 100 dB
VIDEO 90dB
Graphic Equalizer
Center Frequencies ..... 60 Hz, 150 Hz, 400 Hz, 1 kHz, 2.4 kHz, 6 kHz, 15 kHz
Control Range ..... ±12 dB

VIDEO SECTION

VIDEO Inputs/Outputs ..... 1 Vp-p, 75 ohms unbalanced

FM TUNER SECTION

Tuning Frequency Range ..... 87.5 MHz – 108 MHz
Antenna Impedance ..... 75 ohms unbalanced
Sensitivity ..... IHF ... 10.8 dBf (0.95 μV at 75 ohms)
Signal-to-Noise Ratio at 65 dBf (IHF)
MONO ..... 80 dB
STEREO ..... 74 dB
Total Harmonic Distortion at 1,000 Hz
MONO 0.1%
STEREO 0.2%
Frequency Response ..... 30 Hz – 15 kHz $^{+0.5}_{-2.0}$ dB

Stereo Separation ..... 50 dB at 1 kHz
Selectivity (±400 Hz) ..... 53 dB

AM TUNER SECTION

Tuning Frequency Range
530 kHz – 1,610 kHz
(with the AM tuning interval set at 10 kHz)
531 kHz – 1,602 kHz
(with the AM tuning interval set at 9 kHz)
Usable Sensitivity ..... 10 μV/(400 μV/m)
Signal-to-Noise Ratio ..... 50 dB
Total Harmonic Distortion 0.3%
Selectivity ..... 25 dB

GENERAL

Power Consumption ..... 5A...USA and Canada Model/ 500 W...Others
Dimensions ..... 440 (W) × 162 (H) × 420 (D) mm (17-5/16") × (6-3/8") × (16-9/16")
Weight (Net) ..... 14.7 kg (32.4 lb)

Note:
KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Note :
Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the U.S.A. (K) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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